

**Alaskan Way Viaduct Program Construction Traffic Mitigation
Enhanced Transit, Transit Travel Time and Demand Management
Performance Report**

Prepared for:
WSDOT

Prepared by:
**King County Department of Transportation
Metro Service Development Section**

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Projects Overview

SUMMARY

To keep people and goods moving during construction of the Alaskan Way Viaduct Program projects, the Washington State Department of Transportation (WSDOT) invested \$31.9 million between 2008 and June 2014 and contracted with King County Metro (Metro) to enhance transit and water taxi service, improve bus monitoring equipment, and provide transportation demand management (TDM) services.

WSDOT is now continuing to mitigate traffic impacts associated with construction of the Alaskan Way Viaduct Program projects by investing \$24,067,000 for enhanced transit services (contract GCB 1883) from July 1, 2014 to June 30, 2017 and \$1,200,000 in TDM (contracts GCB 1906 and GCA 6141) from July 1, 2014 to June 30, 2017. Performance reports are a requirement of each of these contracts, and this combined report (#20) has been developed to address these contractual requirements.

This report is broken down into three sections:

- **Enhanced Transit Services:** This section compares the Spring 2016 service change data to the baseline 2009 data. This section will track the performance of WSDOT supported transit services that were operated during that period to mitigate construction impacts.
- **Transit Travel Time:** This section describes the changes in transit travel times in key corridors that feed into the Seattle Central Business District (CBD) and changes in travel time that occur within the CBD during the Spring 2016 service change.
- **Transportation Demand Management Report.** This section provides the status and impacts of education and outreach programs and marketing of travel options.

These transit and demand management performance reports will be published two times per year during the life of the construction project. The reports will be available approximately two months after each transit service change, which traditionally occur in March and September.

In the following chapters you will find baseline data, performance measurement methods and measured performance for state-sponsored transit and demand management services:

- Transit capacity and ridership
- Transit travel times
- Transportation demand management trip reduction
- Budget and expenditures

SERVICES AND ACTIVITIES: MARCH 2016 TO SEPTEMBER 2016

Enhanced Transit Service summary

- During this period, ETS trip adds were maintained on Routes 18X, 21X, 56X, 120, 121 and RapidRide E Line (formerly Route 358). No new trips were added during this period.
- No new schedule adjustments were implemented during this period.
- Approximately 1,200 flexible hours were used during the temporary closure of the Alaskan Way Viaduct due to construction activities related to the tunnel-boring machine, “Bertha”, passing underneath the viaduct. Details about transit travel times during the closure are included in a special report within the Transit Travel Time section of this report.

Ridership summary

- Peak period ridership increased in each of the four ETS pathways, and overall increased by 58% relative to the Spring 2009 baseline.
- Leading the growth in ridership at the corridor level was Pathway B (Aurora-Fremont), where WSDOT funded ETS trips on the RapidRide E Line during the Spring 2016 service change.
- Among routes that received ETS improvements, RapidRide E Line (formerly Route 358) had the greatest increase in ridership in absolute terms, attracting over 4,900 additional rides during the peak and shoulder periods

Travel Time Summary

- The Alaskan Way viaduct (AWV) Replacement Project closed the AWV from April 29, 2016 through May 9, 2016 as the tunnel boring machine dug beneath the viaduct. 12 King County Metro routes lost direct access to Downtown Seattle during this closure and the Rapid Ride route D-Line and E-Line were impacted by diverted traffic volumes. This closure resulted in a significant travel time increase on all routes using the AWV. This impact was measured and is attached to this report as an **addendum named “Alaskan Way Viaduct Closure – Transit Impact Report.”**
- Increased volumes on 15th Avenue NW continue to degrade transit travel times, both inbound and outbound of Downtown Seattle. Travel times have increased by 1 -2 minutes compared to the Fall 2015 reporting period, while inbound pathways experienced travel times 4 – 6 minutes greater than baseline conditions.
- Travel times on pathways using Aurora Avenue remain largely unchanged from the previous reporting period. Data for the inbound Aurora Avenue pathway B.2 from Bridge Way & N 38th Street to 3rd Avenue & Battery Street is currently incomplete and will be updated as soon as possible.
- Travel times on pathways using the Alaskan Way Viaduct and surface streets in SODO continue to be impacted by the Wosca Detour, especially in the inbound direction during the AM peak. AM inbound travel times on SR-99 have continued to be 3 – 4 minutes greater than baseline conditions.
- **In the Central Business District, the start of SDOT’s Yesler Bridge Replacement project diverted traffic volumes onto 5th Avenue, leading to an increase in PM travel times of one minute.**

Transportation Demand Management Summary

- Transit Promotions has reduced 675 trips. Developed the Just One Trip campaign to include preparation for the launch of the Just One Trip ORCA card offer and route promotion campaign. Mailers were sent to 29,816 households along the 21X, 56, 120 and 121 route corridors. People began signing up (1,717 by end of this reporting period) and received an ORCA card or Metro free ride tickets to encourage them to try these routes. The mailings were accompanied by geo-targeted social media advertising using Facebook, Twitter and Google Adwords and other digital media channels.
- Employer Outreach has reduced 81 trips. Employer outreach was provided via continued marketing to employers in the target neighborhoods and via staff sales outreach in the Seattle Central Business District, First Hill, Pioneer Square and Belltown. 345 new Passports were sold during this period.

EXPENDITURES: SEPTEMBER 2009 – 3RD QUARTER 2016

As of the end of June 2014, Metro had invoiced WSDOT \$30,843,360 (\$544,456 under GCA 5864, \$28,617,421 under GCA 5820 and \$1,681,483 under GCA 5865) of the state's \$31.9 million investment in enhanced transit and demand management services. Between June of 2014 and September of 2016, Metro has invoiced WSDOT \$16,471,551 (\$16,216,130 under GCB 1883 and \$255,421 under GCB 1906) for the state's investment in enhanced transit and demand management services.

PERFORMANCE REPORT SCHEDULE

Performance Reports will be produced two times a year, approximately two months after the service change. This reporting schedule is provided in more detail in the chart below.

Performance Report Release Dates

																					CURRENT REPORT
Performance Measure Updates Submittal Date	Draft 12-14-09	Volume 1 4-05-10	Volume 2 8-09-10	Volume 3 12-13-10	Volume 4 4-04-11	Volume 5 8-22-11	Volume 6 12-12-11	Volume 7 4-16-12	Volume 8 08-20-12	Volume 9 12-10-12	Volume 10 4-22-13	Volume 11 8-19-13	Volume 12 12-9-13	Volume 13 3-31-14	Volume 14 7-9-15	Volume 15 10-23-15	Volume 16 11-20-15	Volume 17 11-30-15	Volume 18 12-31-15	Volume 19 5-10-16	Volume 20 12-20-16
Reporting Period of Volume Data																					
Ridership/ Capacity/ Utilization Baseline		Feb 09 Jun 09 Sep 09																			
Travel Time Baseline		Sep 2009*																			
Service Plan		As of April 2010	As of Aug 2010	As of Dec 2010	As of April 2011	As of Aug 2011	As of Dec 2011	As of April 2012	As of Aug 2012	As of Dec 2012	As of April 2013	As of Aug 2013	As of Dec 2013	As of April 2014	As of Aug 2014	As of Dec 2014	As of April 2014	As of Aug 2015	As of Dec 2015	As of Sep 2015	As of Feb 2016
Travel Time Monitoring, Ridership/ Capacity/ Utilization Data, TDM Measures			Feb 10- Jun 10	Jun 10– Sept 10	Sep 10 – Feb 11	Feb 11 – Jun 11	Jun 11 – Sep 11	Oct 11 – Feb 12	Feb 12 – Jun 12	Jun 12 – Sep 12	Sep 12 – Feb 13	Feb 13 – Jun 13	Jun 13 – Sep 13	Sep 13 – Feb 14	Feb 14 – Jun 14	Jun 14 – Sep 14	Sep 14 – Feb 15	Feb 15 – Jun 15	Jun 15 – Sep 15	Sep 15 – Mar 16	Mar 16 – Sep 16

*The September 2009 travel time data will serve as the travel time baseline, against which, all travel time monitoring activities will be compared

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Enhanced Transit Service Report

INTRODUCTION

The Nisqually earthquake highlighted the structural vulnerability of the State's Alaskan Way Viaduct portion of SR 99 and the region began immediately planning for its reinforcement or replacement. SR 99 serves as a major transportation facility carrying approximately 110,000 vehicles a day to and through downtown Seattle. As the region planned for its replacement it became apparent that a facility of this size could not be planned for and replaced without considering the impacts that the construction phase and final design would have on virtually all major north/south arterials and I-5. Inevitable construction impacts and potential for reduced capacity in the final SR 99 design increased interest in utilization of transit as a more compact travel alternative. In March of 2007, as planning continued on the central waterfront portion of SR 99 and the Viaduct (King St. to Battery Street), Governor Gregoire identified several projects for the Early Safety and Mobility projects, i.e. "Moving Forward Projects". Enhanced transit services were one of the major components of the Moving Forward Projects.

One of the major objectives of the enhanced transit services agreement is to "reduce vehicle travel demand in order to help mitigate construction related mobility impacts on the general public." Metro identified 33 candidate routes that, with additional service could help reduce vehicle travel demand. Greater transit utilization can help maintain public mobility while roadway capacity is constrained. The purpose of this report is to understand and document the usefulness of WSDOT's resources that will be used to maintain and enhance transit service in the SR 99 corridor.

In the Spring of 2009, the baseline against which service in this report will be compared, Metro transit service on these pathways provided an estimated 80,780 unlinked passenger trips daily. A conservative estimate would value these trips to equal approximately 39,000 vehicle trips a day in the SR 99 corridor. This transit service provided mobility to thousands of people per day and removed nearly 39,000 vehicle trips a day reducing delay for all other vehicular traffic in the corridor.

ENHANCED TRANSIT SERVICE REPORT PURPOSE

The Enhanced Transit Service Report provides various data that are useful in understanding the impact of the 30 additional trips funded by WSDOT. The trips funded by WSDOT as part of the March service change were scheduled on routes 21 Express (X), 56X, 120 (part of Pathway J), 121 (part of Pathway I), 18X (part of pathway A) and RapidRide E Line (formerly Route 358, part of pathway B). This report compares Spring 2009 baseline performance measures with Spring of 2016 performance measures. As with previous volumes, these transit performance measures are presented in daily totals and by peak, shoulder and midday periods. Ridership data for the past three years, 2014, 2015 and 2016 is also included to show short term trends.

Time of Day and Pathway Group designations are described below:

- **Time of Day Designations:** Time of day designations measure changes in transit supply and use by peak period (6-9am, 3-6pm), shoulder periods (9-10am, 2-3pm, 6-7pm) and midday periods (10am-2pm).
- **Pathway Groups:** The four pathway groups defined below are the transit corridors of emphasis for this contract. A more complete description is available in Travel Time Table 1. System-wide ridership numbers are also shown to give perspective on the relative performance of the four pathway groups when compared to the system as a whole.
- **Pathway Groups:** The four pathway groups defined below are the transit corridors of emphasis for this contract. A more complete description is available in Travel Time Table 1, page 23. System-wide

ridership numbers are also shown to give perspective on the relative performance of the four pathway groups when compared to the system as a whole.

Pathway A - Ballard/Magnolia: 15th Avenue and Elliot Avenue W between NW 85th Street and 1st Avenue and Denny Way, Including routes 15X, 17EX, 18EX, 19, 24, 32, 33 and RapidRide D Line.

Pathway B – Aurora/Fremont: Aurora Avenue, Nickerson Street, Dexter Avenue and Westlake Avenue between NW 85th Street, Ballard Bridge, Fremont and 3rd Avenue/Denny Way, including routes 5, 5X, 16, 26, 26X, 28, 28X, 40, 62 and RapidRide E Line.

Pathway I: - SODO: 1st Avenue S, East Marginal Way, and 4th Avenue S between S Michigan and S Jackson Streets, including routes 113, 121, 123, 124, 131 and 132.

Pathway J: - West Seattle: Admiral Way, Fauntleroy Way, 35th Avenue SW, Delridge Way and SR 99 between California Avenue, SW Morgan Street, Andover Street and Columbia/Seneca Streets, including routes 21, 21X, 37, 50, 55, 56X, 57, 116, 118X, 119X, 120, 125 and RapidRide C Line.

RIDERSHIP TRENDS

Transit ridership is influenced by many factors, including amount of service provided, seasonal travel patterns, the cost of driving (fuel/vehicle expenses and time), employment, route design, and construction impacts. The purpose of looking at ridership trend data is to measure and understand these influences. This section includes a brief overview of ridership trends over the last three years.

Three-Year Ridership Trends – System-wide ridership grew each year between 2013 and 2015 and increased by 2% over the three-year period. Higher fuel prices, a somewhat stabilized economy and a major restructuring of service are likely contributing factors to this ridership growth.

The Enhanced Transit Service Table 1 below shows that ridership growth rates were considerably in excess of the system growth rate in all four Enhanced Transit Service (ETS) pathways. Ridership increased in each corridor in each of the past three years.

Enhanced Transit Service Table 1

3 YEAR TRANSIT CORRIDOR WEEKDAY RIDERSHIP TREND FOR SUMMER SERVICE CHANGE				
Ridership Group	2014	2015	2016	% Change 2014-2016
System-wide Ridership	401,000	403,850	406,940	1%
Total of Pathways	118,500	125,510	128,520	8%
Pathway A – Ballard/Magnolia	24,380	25,480	25,540	5%
Pathway B – Aurora Fremont	45,420	49,210	53,640	18%
Pathway I – SODO/Georgetown	14,400	15,130	14,120	-2%
Pathway J – West Seattle	34,300	35,690	35,220	3%

RIDERSHIP CHANGE IN SPRING 2016 COMPARED TO 2009 BASELINE

The Enhanced Transit Service Table 2 below compares the Spring 2016 system-wide and Enhanced Transit Service pathway ridership with the Spring 2009 baseline for average weekday ridership by time of day.

Ridership Changes Vary by Time of Day – Evaluating aggregate ridership numbers alone can sometimes hide shifts in ridership that have important planning implications. Ridership analysis by time of day allows you to see which time period has the greatest demand for resources. Employment driven transit service tends to be oriented toward the peak period (6-9 am) and (3-6 pm) while general purpose mobility occurs during all periods of the day. As shown in Table 2, at a system-wide level peak period ridership accounts for about half of daily ridership. This is also true for the total of all pathways. Ridership has increased in every pathway and every time period relative to the baseline.

The system-wide and pathway trends shown in Table 2 provide more context for which we will evaluate the effectiveness of the WSDOT funded construction mitigation.

Enhanced Transit Service Table 2

COMPARISON OF SPRING 2009 BASELINE WEEKDAY RIDERSHIP BY TIME OF DAY AND PATHWAY WITH SPRING 2016 SERVICE CHANGE RIDERSHIP								
Ridership Group	Avg. Weekday		Peak Period*		Shoulder Periods		Midday Period	
	2009	2016 (% Change)	2009	2016 (% Change)	2009	2016 (% Change)	2009	2016 (% Change)
System-wide Ridership	375,000	406,940 (9%)	184,000	202,000 (10%)	68,000	75,000 (10%)	79,000	76,000 (-4%)
Total of Pathways†	80,090	124,310 [128,520] (55%)	39,930	62,930 [64,860] (58%)	14,260	21,570 [22,280] (51%)	15,580	22,160 [22,980] (42%)
Pathway A – Ballard/Magnolia	16,920	25,540 (51%)	8,930	13,350 (49%)	2,950	4,400 (49%)	3,080	4,070 (32%)
Pathway B – Aurora Fremont	31,970	53,640 (68%)	14,880	25,380 (71%)	5,860	9,730 (66%)	6,690	10,340 (55%)
Pathway I – SODO/Georgetown†	8,260	9,910 [14,120] (20%)	4,440	5,540 [7,470] (25%)	1,370	1,560 [2,270] (14%)	1,400	1,570 [2,390] (12%)
Pathway J – West Seattle†	22,940	35,220 (54%)	11,680	18,660 (60%)	4,080	5,880 (44%)	4,410	6,180 (40%)
*Peak Period is 6-9 am and 3-6 pm; Shoulder Period is 9-10 am, 2-3 pm, and 6-7 pm; Midday is 10 am - 2 pm. †The increase in ridership reported in the brackets is due to the addition of route 124 to Pathway I. Route 124 began operating in Pathway I in September 2009.								

PERFORMANCE OF ENHANCED TRANSIT SERVICE ADDITIONS

Ridership increased during the peak period on all six routes that received Enhanced Transit Service (ETS) funding during the Spring 2016 service change. With the exception of Route 121, ridership also increased during the shoulder periods on routes that received ETS funding. The largest absolute change in peak and shoulder period ridership occurred on RapidRide E Line relative to Route 358, which it replaced. Peak direction frequencies (southbound in the AM; northbound in the PM) were upgraded from every 15 minutes to every 7-10 minutes on Route 358 in Fall 2011. Frequencies in the reverse peak direction (northbound in the AM; southbound in the PM) were improved when the route was converted to the E Line in Spring 2014.

In total, ridership performance of ETS routes outperformed the system-wide trend by 46 percentage points.

Enhanced Transit Service Table 3

COMPARISON OF RIDERSHIP PERFORMANCE OF SERVICES THAT RECEIVED WSDOT FUNDED ENHANCEMENTS WITH SPRING 2009 BASELINE								
Route/Pathway	Avg. Weekday		Peak Period*		Shoulder Periods		Midday Period	
	2009	2016 (% Change)	2009	2016 (% Change)	2009	2016 (% Change)	2009	2016 (% Change)
18X / Pathway A	760	1,010 (33%)	760	890 (17%)	No Service	120 (N/A)	No Service	No Service
21X / Pathway J	770	1,040 (35%)	740	950 (28%)	30	90 (200%)	No Service	No Service
56X / Pathway J	590	760 (29%)	510	620 (22%)	70	120 (71%)	No Service	No Service
120 / Pathway J	6,850	9,140 (33%)	2,900	4,120 (42%)	1,370	1,560 (14%)	1,600	1,950 (22%)
121 / Pathway I	1,090	1,110 (2%)	730	920 (26%)	210	140 (-33%)	90	No Service
RapidRide E Line / Pathway B	9,900	17,780 (80%)	4,260	7,810 (83%)	1,880	3,230 (72%)	2,240	3,700 (65%)
Enhanced Transit Service Route Total	19,960	30,840 (55%)	9,900	15,310 (54%)	3,560	5,260 (48%)	3,930	5,650 (44%)
*Peak Period is 6-9 am and 3-6 pm; Shoulder Period is 9-10 am, 2-3 pm, and 6-7 pm; Midday is 10 am - 2 pm. New ETS Routes relative to 2009 baseline: 18X, 120 and RapidRide E Line (formerly Route 358)								

TRANSIT CAPACITY

The primary way transit services will mitigate construction impacts is by providing an alternative travel option to driving alone. In order to attract people to transit service, that service must be reliable. In addition, sufficient transit capacity is a prerequisite to establishing transit as a desirable alternative travel option.

Spring 2016 Transit Capacity Compared to Spring 2009 Baseline – The baseline is the scheduled number of seats that are supplied each weekday within a pathway group for Spring 2009. Enhanced Transit Service Table 4 shows the number of seats by time of day for Spring 2016 for the four different pathways compared to the baseline. The pathway trends shown Table 4 are provided for context to help evaluate the effectiveness of WSDOT investments.

Overall, peak period capacity increased between 2009 and 2016. The Spring 2016 service change continued the additional transit capacity added on Route 18X (Pathway A route), RapidRide E Line (formerly Route 358; Pathway B route), Route 121 (Pathway I route) and Routes 21X, 56X, and 120 (Pathway J routes). However, other significant changes were implemented in all four pathways as part of the Fall 2012 service restructure. In addition, Route 358 was converted to the RapidRide E Line in Spring 2014. These changes affected both the number of trips and the number of seats per trip, the two factors that together determine seating capacity in each corridor. Consequently, capacity increases on individual WSDOT-funded routes may not directly correlate to changes in the pathways containing those routes.

Enhanced Transit Service Table 4

SPRING 2016 SERVICE CHANGE COMPARISON OF WEEKDAY TRANSIT SEATING CAPACITY BY CORRIDOR AND TIME OF DAY WITH SPRING 2009 BASELINE						
Pathway	Peak Period		Shoulder Periods		Midday Period	
	2009	2016 (% Change)	2009	2016 (% Change)	2009	2016 (% Change)
Pathway A – Ballard/Magnolia	9,160	10,350 (13%)	2,940	3,990 (36%)	3,600	4,460 (24%)
Pathway B – Aurora Fremont	15,530	18,050 (16%)	5,810	7,770 (34%)	7,640	9,670 (27%)
Pathway I – SODO/Georgetown*	6,190	6,360 [8,490] (3%)	1,890	2,170 [3,030] (15%)	1,940	2,020 [3,030] (4%)
Pathway J – West Seattle	15,920	17,510 (10%)	5,610	5,990 (7%)	7,220	6,680 (-7%)
Total of all Pathways	46,800	52,270 [54,400] (12%)	16,250	19,920 [20,780] (23%)	20,400	22,830 [21,590] (12%)
*The increase in seats reported in the brackets is due to the addition of route 124 to the pathway. Route 124 began operating in pathway "I" in September 2009.						

Enhanced Transit Service Table 5 compares the actual transit capacity delivered during the Spring 2016 service change to the Spring 2016 enhanced transit service proposal. The number of seats specified in the ETS proposal assumed an average seating capacity of 58 on each ETS route, whereas the number of seats provided is based on the specific coach types assigned during the service change. Because RapidRide coaches have fewer seats

than other low-floor articulated coaches, the actual number of seats provided on RapidRide E Line was slightly lower than proposed.

During the Spring 2016 service change WSDOT funds provided 16 percent more peak period transit capacity on routes 18X, 21X, 56X, 120, 121 and RapidRide E Line. As will be shown in the next section, this additional capacity helped to mitigate the impact on transit capacity level of service caused by a 54 percent increase in peak period ridership relative to the Spring 2009 baseline.

Enhanced Transit Service Table 5

COMPARISON OF WSDOT FUNDED TRANSIT CAPACITY WITH METRO FUNDED PEAK PERIOD TRANSIT CAPACITY				
Spring 2016				
Route / Pathway	Metro Funded Peak Period*	Actual WSDOT Funded*	Spring 2015 ETS Proposal†	% Increase in Seating Capacity Compared to Metro Peak Period
18X	620	110	120	18%
21X	690	350	350	51%
56X	490	220	230	45%
120	3,430	460	460	13%
121	1,130	210	230	19%
E Line	3,690	290	350	8%
Total	10,050	1,640	1,740	16%
*Actual average seats/trip for Spring 2016 was as follows: 18X:58, 21X:56, 56X:52, 120:58, 121:58 and 358:48				
†ETS Proposal was based on 58 seats/trip				

TRANSIT CAPACITY LEVEL OF SERVICE

Transit capacity level of service (LOS) measures how riders perceive crowding and comfort on transit services. The second edition of the Transit Cooperative Research Program's Transit Capacity and Quality of Service Manual describes the importance of transit capacity LOS in the following statement:

From the passenger's perspective, passenger loads reflect the comfort level of the on-board vehicle portion of a transit trip—both in terms of being able to find a seat and in overall crowding levels within the vehicle. From a transit operator's perspective, a poor LOS may indicate the need to increase service frequency or vehicle size in order to reduce crowding and provide a more comfortable ride for passengers. A poor passenger load LOS indicates that dwell times will be longer for a given passenger boarding and alighting demand at a transit stop and, as a result, travel times and service reliability will be negatively affected.

The Transit Capacity and Quality of Service Manual provides suggested capacity LOS guidelines. This report uses the ratio of passengers to seats, or Load Factor to evaluate the transit capacity LOS on routes in the identified pathways. The level of service thresholds are described in the table below.

Enhanced Transit Service Table 6**TRANSIT CAPACITY AND QUALITY OF SERVICE MANUAL LOAD FACTOR GUIDELINES**

LOS	Load Factor (passengers/seat)	Comments
A	0.00-0.50	No passenger need sit next to another
B	0.51-0.75	Passengers can choose where to sit
C	0.76-1.00	All passengers can sit
D	1.01-1.25*	Comfortable standee load for design
E	1.26-1.50*	Maximum schedule load
F	>1.50*	Crush load

*Approximate value for comparison, for vehicles designed to have most passengers seated.

Spring 2016 Transit Capacity Compared to Spring 2009 Baseline – Enhanced Transit Service tables 7, and 8 display the number and percent of riders experiencing a transit capacity LOS of C or worse when traveling in the peak direction during the peak period as compared to the Spring 2009 baseline.

Crowding happens when demand pushes the limits of capacity. Changes in crowding reflect a change in the capacity, the demand or both. The 54 percent increase in peak period ridership among routes with WSDOT-funded trips has resulted in a greater number of riders experiencing transit capacity level of service C or worse, **despite WSDOT's** investment. Overall, there were 3,010 more AM and 2,790 more PM peak period riders experiencing transit capacity level of service C or worse than there were in Spring 2009. The increase in riders experiencing transit capacity level of service C or worse on routes with WSDOT funded trips was comparable to the increase in riders experiencing transit capacity level of service C or worse for the pathways overall, as shown in Tables 9 and 10.

Enhanced Transit Service Table 7**COMPARISON OF SPRING 2016 TRANSIT CAPACITY LOS WITH SPRING 2009 BASELINE**

AM 6:00-9:00 Inbound								
Route/ Pathway	Average Load Factor		# of trips providing a transit capacity LOS of C or worse		% of riders at a transit capacity LOS of C or worse		Est. Number of daily riders at a transit capacity LOS of C or worse	
	2009	2016	2009	2016	2009	2016	2009	2016
18X	0.87	1.14	4	5	77%	100%	270	390
21X	0.83	0.83	5	7	87%	89%	340	430
56X	0.70	0.86	3	5	76%	97%	200	310
120	0.76	0.90	6	15	46%	87%	400	1,160
121	0.47	0.73	0	3	0%	60%	0	200
E Line	0.73	1.36	9	25	57%	100%	730	2,460
Total							1,940	4,950

Enhanced Transit Service Table 8**COMPARISON OF SPRING 2016 TRANSIT CAPACITY LOS WITH SPRING 2009 BASELINE**

PM 3:00-6:00 Outbound								
Route/ Pathway	Average Load Factor		# of trips providing a transit capacity LOS of C or worse		% of riders at a transit capacity LOS of C or worse		Est. Number of daily riders at a transit capacity LOS of C or worse	
	2009	2016	2009	2016	2009	2016	2009	2016
18X	0.78	0.98	4	6	63%	91%	260	470
21X	0.78	0.75	2	4	47%	60%	160	280
56X	0.68	0.75	2	3	53%	70%	130	200
120	0.77	0.79	9	14	60%	65%	610	1,160
121	0.68	0.64	2	3	29%	57%	90	180
E Line	0.80	1.29	15	29	74%	100%	1,140	2,890
Total							2,390	5,180

Enhanced Transit Service tables 9, and 10 display similar information as tables 7 and 8 for all the ETS pathways. In addition they give the number and percent of riders that experience a transit capacity LOS of C or worse for those traveling in off peak periods. The off peak information is included to show that crowding occurs at times outside the peak period. The table also provides the total daily trips and estimated number of riders that experience LOS C or worse. These tables are provided for context to evaluate the effectiveness of WSDOT funded construction mitigation services.

Enhanced Transit Service Table 9

SPRING 2016 SERVICE CHANGE COMPARISON OF INBOUND WEEKDAY PASSENGER LOADS BY CORRIDOR PEAK PERIOD SUMMARY WITH SPRING 2009 BASELINE						
AM 6:00-9:00 Inbound						
Pathway	% of riders at a transit capacity LOS of C or worse		# of trips in period providing a transit capacity LOS of C or worse		Est. Number of daily riders at a transit capacity LOS of C or worse	
	2009	2016	2009	2016	2009	2016
Pathway A – Ballard/Magnolia	58%	89%	24	50	1,480	3,890
Pathway B – Aurora Fremont	53%	96%	37	82	2,500	6,830
Pathway I – SODO/Georgetown	16%	40%	6	13	270	780
Pathway J – West Seattle	52%	91%	38	84	2,170	5,730
All Pathways	49%	87%	105	229	6,420	17,230
Inbound Trips All Other Times of Day						
	2009	2016	2009	2016	2009	2016
Pathway A – Ballard/Magnolia	27%	53%	27	55	1,360	4,120
Pathway B – Aurora Fremont	26%	39%	46	90	2,870	6,880
Pathway I – SODO/Georgetown	8%	5%	5	4	210	190
Pathway J – West Seattle	16%	20%	22	28	1,150	1,970
All Pathways	22%	33%	100	177	5,590	13,160
Total Inbound Trips			205	406	12,010	30,390

Enhanced Transit Service Table 10

SPRING 2016 SERVICE CHANGE COMPARISON OF OUTBOUND WEEKDAY PASSENGER LOADS BY CORRIDOR PEAK PERIOD SUMMARY WITH SPRING 2009 BASELINE						
PM 3:00 – 6:00 Outbound						
Corridor	% of riders at a transit capacity LOS of C or worse		# of trips in period providing a transit capacity LOS of C or worse		Est. Number of daily riders at a transit capacity LOS of C or worse	
	2009	2016	2009	2016	2009	2016
Pathway A – Ballard/Magnolia	45%	81%	22	49	1,320	3,660
Pathway B – Aurora Fremont	59%	75%	48	86	3,000	7,060
Pathway I – SODO/Georgetown	40%	37%	12	14	560	830
Pathway J – West Seattle	51%	67%	34	67	2,090	5,010
All Pathways	52%	70%	116	216	6,970	16,560
Outbound Trips All Other Times of Day						
	2009	2016	2009	2016	2009	2016
Pathway A – Ballard/Magnolia	22%	43%	24	58	1,280	4,070
Pathway B – Aurora Fremont	23%	29%	38	79	2,550	5,690
Pathway I – SODO/Georgetown	6%	21%	3	22	140	1,300
Pathway J – West Seattle	11%	29%	14	49	840	3,310
All Pathways	18%	31%	79	208	4,810	14,370
Total Outbound Trips			195	424	11,780	30,930

FLEXIBLE TRANSIT SERVICE

The Enhanced Transit Service contract provides for the use of flexible hours to meet the day to day variations in construction related traffic disruptions. These hours are important for Metro to be able to respond immediately to conditions on the street. In the Spring 2016 ETS proposal, Metro budgeted 3,400 hours of flexible services to meet these needs. However, only 1,212 flexible hours were deployed during the course of the Spring 2016 service change. These flexible hours were used to provide standby coaches that provided added capacity and maintained bus schedules during the closure of the Alaskan Way Viaduct due to construction activities related to the tunnel-boring machine, "Bertha", passing underneath the viaduct.

The Enhanced Transit Service Table 11 below reports on all flexible hours that were used during the Spring 2016 service change. The trips and boardings reported on this table come from self-reported driver count sheets. Table 11 table shows, approximately 7,500 transit trips were taken on service provided by flexible hours, showing how important they have been on days when traffic delays have caused transit services to fall behind. The real-time response of these services allows for greater reliability of service and has helped to maintain public confidence in riding transit.

Enhanced Transit Service Table 11

Fall 2015 Use of Flexible Hours						
Event	Dates	Number of weekdays	Number of weekend days	Total Flexible hours	Number of trips provided	Number of Boardings
Alaskan Way Viaduct temporary closure	4/29/2016 through 5/8/2016	5	3	1,212	270	7,511

Spring 2016
ETS Proposal
Estimated
Flexible Hours: 3,400

Transit Travel Time Report

TRAVEL TIME REPORT PURPOSE

As part of the AWW Moving Forward contract, Metro received funding to improve the equipment that monitors bus travel time through the construction corridors. The Transit Travel Time report uses data from this equipment provided by WSDOT and other sources throughout the network. This report summarizes data collected to monitor transit travel times along pathways that are expected to be most heavily impacted by the Moving Forward project of the AWW program.

This report compares the Spring 2016 Service Change condition to the previous travel time report (Fall 2015) and the baseline condition (Fall 2009). The list below shows the dates of when travel time observations were collected for those conditions:

- Fall 2009 service change (baseline condition): September 21, 2009 through October 16, 2009
- Fall 2015 service change condition: October 12, 2015 through November 9, 2015
- Spring 2016 service change condition: March 28, 2016 through April 25, 2016

Travel time data was collected and processed as discussed below:

- Transit travel time was measured on key transit corridors feeding into and within the Seattle Central Business District (CBD). The data for this was collected through:
 - o Automatic Vehicle Identification (AVI) readers installed at endpoints of key transit corridors (Baseline data only)
 - o **Data from Metro's signpost**-based Automatic Vehicle Location (AVL) system (Baseline data only)
 - o **Logs from Metro's On-Board System (OBS)**
- Pathways were defined by the roadway segments on which one or more transit routes operate.
- **Pathways were grouped by geographic market area, as shown in the "Pathways and Pathway Groups" map on the next page. Each group consists of several distinct pathways described in the "Description of Pathways and Associated Transit Routes" (Travel Time Table 1).**
- Because pathway lengths vary, and travel times will not be comparable across pathways, travel *speeds* are used to assess pathway group performance and travel *times* are used to assess individual pathway performance.

This volume of the report also includes transit travel time information related to the temporary closure of the Alaskan Way Viaduct from April 29, 2016 through May 9, 2016, during the Spring 2016 Service Change, as the tunnel boring machine passed beneath the viaduct. Details regarding travel times affected by the short-term closure of the viaduct can be found on pages 28-32.

System Status and Data Availability

This report is the seventh using the new data source for measuring bus travel times. The AVI equipment has reached the end of its useful life and has become difficult to maintain while ensuring a steady stream of reliable **data at all locations. The new data source takes advantage of Metro's new On-Board System (OBS).** OBS is used to trigger automated stop announcements, send transit signal priority (TSP) requests, and it records an

extensive amount of delay and timestamp information. Virtual TSP points were loaded into OBS to correspond with the locations of the AVI readers, to enable a consistent data set between AVI and OBS systems.

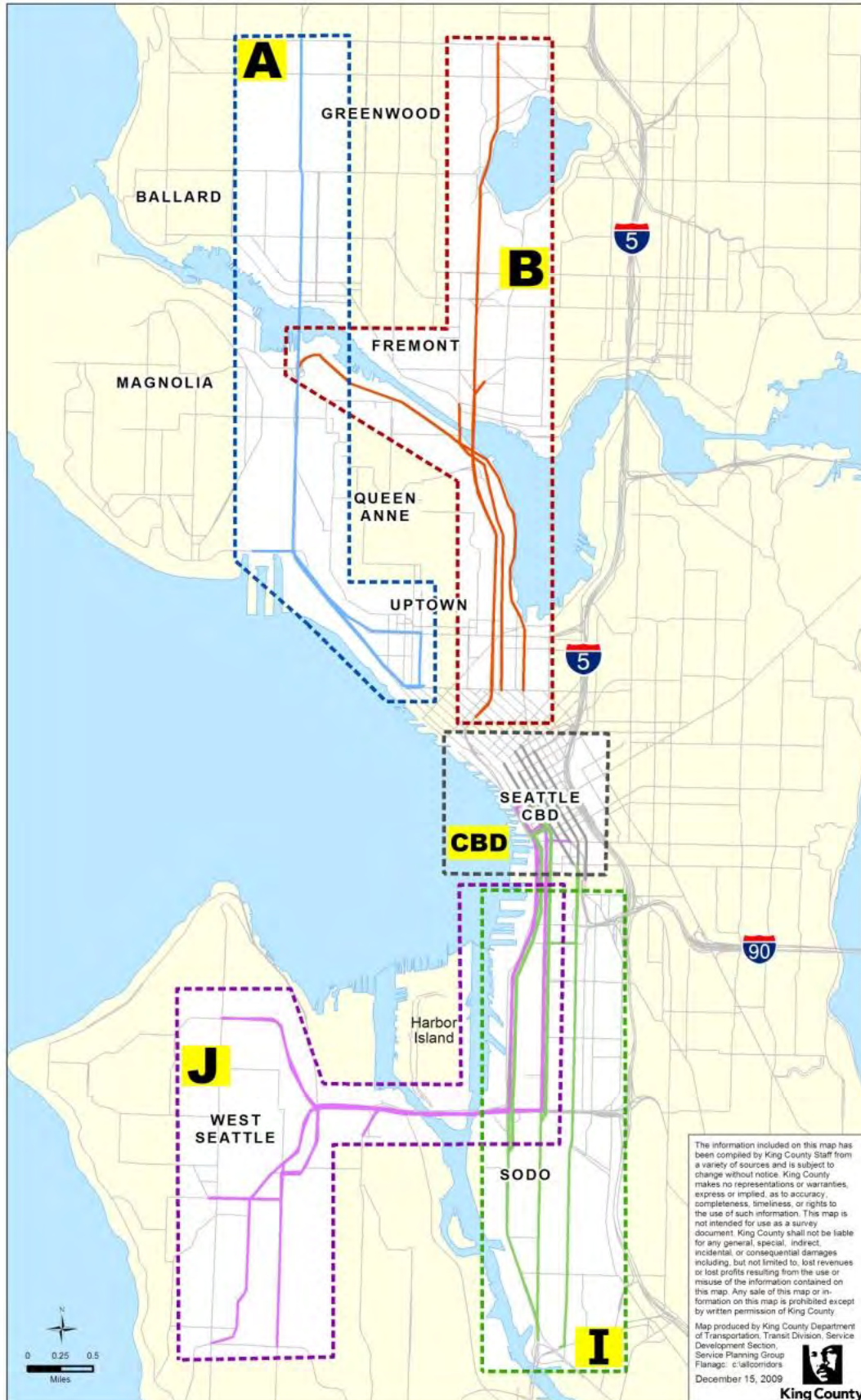
|
The change in data sources required a change in the pathway definition covering 2nd Ave in the CBD. Pathway CBD2A uses slightly different endpoints as the old CBD2 pathway. The baseline data is not consistent with this new pathway, so it was removed from the report.

Several pathways are missing from this draft report due to an apparent error in trip identification numbers. It appears that trip assignments were not correctly made, resulting in no returns for travel time queries. These issues are currently being addressed; Pathways currently missing will be assigned new end points and will be included in future reports. Previous reporting periods will be adjusted to reflect this change. Pathways incomplete or missing in this draft are:

- J.5: Inbound only. (Delridge Way SW & SW Andover Street to 1st Avenue and Seneca Street via the Alaskan Way Viaduct) The J.5 pathway is similar to J.7, as both use the Alaskan Way Viaduct and terminate at 1st Avenue and Seneca Street. Consequently, reports of travel speeds for the Alaskan Way Viaduct should be unaffected.
- B.2: Inbound only. (Bridge Way & N 38th Street to 3rd Avenue & Battery Street via Aurora Avenue) Data is partial, as the hours of 7AM – 11AM are reported. The B.2 pathway is similar to B.1, as both use Aurora Avenue as a pathway to 3rd Avenue and Battery Street. Consequently, reports of travel speeds for Aurora Avenue should be unaffected.
- J.2: Inbound only. (35th Avenue SW & SW Morgan Street to 3rd Avenue & Seneca Street via 1st Avenue S) Data has not matched trip identification numbers for three reporting periods. Future reports will include revised end points. There are no pathways that closely resemble this pathway, and so travel speed reporting for 1st Avenue S is incomplete.
- I.2: Inbound only. (4th Avenue S & S Michigan Street to 4th Avenue & Jackson Street via 4th Avenue S) Data is partial, as the hours of 7AM, 6 and 7 PM are reported. There are no pathways that closely resemble this pathway, and so travel speed reporting for 4th Avenue S is incomplete.

Pathways and Pathway Groups

Transit Routes Affected by AWW Project



Travel Time Table 1

Description of Pathways and Associated Transit Routes					
Pathway Group	Pathway	Market Coverage	From	To	Current Transit Routes*
A	A.1	Ballard, Uptown	15 th NW/NW 85th	1 st Ave/Denny	D-Line
	A.2	Ballard	15 th NW/NW 85th	1 st Ave/Denny	15X, [17X, 18X]
	A.3	Magnolia	Elliot Ave/Magnolia Br.	1 st Ave/Denny	19, 24, 33
B	B.1	North Seattle	Aurora Ave NW/NE 85 th	3 rd Ave/Battery	E-Line
	B.2	North Seattle	Bridge Way/N 38 th	3 rd Ave/Battery	5, [5X, 26X, 28X]
	B.3	Fremont	Dexter/Westlake/Fremont	Dexter/Denny	26, 28
	B.4	South Lake Union	Ballard Br./Nickerson	Denny/Westlake	none
	B.5	South Lake Union	15 th NW/Leary Way	Denny/Westlake	40
I	I.1	South Seattle/Burien	1 st Ave S/E. Marginal (OB) S Alaska/E Marginal (IB)	1 st Ave/Columbia (OB) 1 st Ave/Seneca (IB)	121, 122, 123
	I.2	South Seattle/Burien	4 th Ave S/S Michigan	4 th Ave/Jackson	131, 132
J	J.1	West Seattle	Alaska Jct	3 rd Ave/Seneca	none
	J.2	West Seattle	35 th Ave SW/SW Morgan	3 rd Ave/Seneca	21
	J.3	West Seattle	Alaska Jct.	1 st Ave/Columbia (OB) 1 st Ave/Seneca (IB)	C-Line, [21X]
	J.4	West Seattle	California Ave/SW Fauntleroy Way	3 rd Ave/Yesler	116
	J.5	West Seattle/Burien	Delridge Way/Andover	1 st Ave/Columbia (OB) 1 st Ave/Seneca (IB)	120, 125
	J.7	West Seattle	Admiral Way/California Ave	1 st Ave/Columbia (OB) 1 st Ave/Seneca (IB)	56X, 57
CBD	CBD2A	2 nd Ave	2nd Ave/Pike **	5th Ave/Weller **	Many
	CBD3	3 rd Ave	3 rd Ave/Stewart	3 rd Ave/Yesler	Many
	CBD4	4 th Ave	4 th Ave/Jackson	4 th Ave/Stewart	Many
	CBD5	5 th Ave	5 th Ave/Pine	5 th Ave/Weller	Many
	Columbia	Columbia St	3rd Ave/Seneca	1st Ave/Columbia	Many

*Routes identified with an **X** are express routes. Routes in [BRACKETS] are routes that parallel a significant portion of the pathway, but are not included in the data for that pathway. Because so many routes operate on the CBD pathways they are not all listed here.

** Adjusted start/end point due to transition to new OBS data source

TRAVEL TIME DATA

A summary of performance results are reported on the “Performance by Pathway Group” and “Performance of Pathways with Service Additions” tables below, while detailed travel time charts of the individual pathways are included in Appendix A.

Travel Time Table 2 below shows daily median travel speeds and range of speeds experienced by each pathway group during the am and pm peaks, including a comparison with the baseline condition. The “Median Speed” is the speed where 50 percent of the observed transit speeds are faster and 50 percent of the observed transit speeds are slower than the median speed. The median speed includes all transit trips operating along all of the pathways in each group, in both directions, on weekdays between 5 am and 8 pm. Median speed is reported rather than average speed because the median is less sensitive to unusual events such as bus breakdowns or accidents that could skew the average. This measure gives an overall performance metric for the pathway group, and is a useful aggregate measure to assess whether the speeds of individual pathways in a given group are trending up or down. **It is not, however, appropriate to use the pathway group median speed as an assessment of travel speed for any individual pathway.** In Appendix A, observed travel times are aggregated by hour of day for both directions of each pathway.

The strongest influence in travel time variability is time of day and direction of travel. The “PM Peak Period Hourly Median Range” and “AM Peak Hourly Median Range” are aggregate performance measures for the times of day that traditionally have the most congestion. The PM Peak Range is the range between the median speed for the slowest hour of the slowest pathway and the fastest hour of the fastest pathway between 3 pm and 6 pm; the AM Peak Range is a similar comparison of speeds between 6 am and 9 am. These ranges can be used to understand pathway group performance and assess whether, as a group, speeds are trending up or down during periods when daily travel demand is the greatest.

Travel Time Table 2: Spring 2016, Fall 2015, and Baseline Travel Speeds

Performance by Pathway Group: Spring 2016, Fall 2015 & Baseline Comparison					
Pathway Group	Area	Service Change Period	Median Speed [MPH]	AM Peak Period Hourly Median Range [MPH]	PM Peak Period Hourly Median Range [MPH]
A	Ballard, Interbay	Spring 16'	13.6	12.7 - 14.9	12.3 - 15.6
		Fall 15'	13.8	13.0 - 14.6	12.2 - 16.0
		Baseline	14.9	12.1 - 23.6	11.4 - 19.0
B	Aurora, Fremont	Spring 16'	18.7	12.4 - 23.0	11.3 - 21.2
		Fall 15'	14.5	19.7 - 21.5	17.9 - 19.6
		Baseline	18.6	11.0 - 22.7	11.0 - 20.3
I	SODO, Georgetown	Spring 16'	18.8	17.6 - 28.3	14.3 - 28.0
		Fall 15'	16.2	17.2 - 26.2	14.0 - 24.0
		Baseline	17.7	16.4 - 48.4	12.7 - 21.7
J (1st)	West Seattle (1st)	Spring 16'	15.0	14.6 - 15.3	12.6 - 17.8
		Fall 15'	14.2	14.5 - 15.3	13.0 - 17.6
		Baseline	15.9	11.9 - 20.7	12.4 - 21.0
J (AWV)	West Seattle (AWV)	Spring 16'	23.5	18.8 - 23.0	21.0 - 24.3
		Fall 15'	25.0	16.5 - 29.2	21.1 - 29.8
		Baseline	30.1	20.1 - 36.6	22.1 - 33.8
CBD	2nd-5th Aves	Spring 16'	7.6	6.9 - 9.1	5.8 - 7.1
		Fall 15'	7.0	6.5 - 7.5	5.1 - 6.4
		Baseline	7.2	5.9 - 9.9	5.4 - 9.6

* AM peak includes 6 – 9 am and inbound trips only, pm peak includes 3 – 6 pm and outbound trips only, except CBD group includes both directions for am and pm peak ranges.

Spring 2016 Highlights

Rapid Ride service to Downtown Seattle via the C and D-Line was significantly changed due to the extension of these two routes. The C-Line has been extended to South Lake Union via Westlake Avenue, providing a new direct connection between West Seattle and South Lake Union. The D-Line has been extended to Pioneer Square via Third Avenue. D-Line travel times have seen improvement from capital investments along 15th Avenue W and Elliot Avenue W, an improvement of 1-4 minutes compared to the Fall 2015 reporting period, coming closer to mid-day baseline conditions. C-Line performance has been improved for inbound coaches during the AM period, an improvement of 1.5 minutes compared to the Fall 2015 reporting period, while performance is still 1 – 3 minutes worse than the baseline.

In the South Portal area, construction activities and use of the WOSCA Detour continued to impact transit pathways on the AWW and parallel local streets. Pathways via 4th Avenue S continue to see improvement seen in the Fall 2015 reporting period.

A handful of private development construction projects with short and long term lane closures continued during this reporting period, particularly in the South Lake Union and north CBD area.

A Pathways

"A" Pathways overall continue to show an increase of travel times, particularly for AM, inbound buses comparing Spring 2016 to Fall 2015 and Baseline conditions. Travel time increases of 2-5 minutes on this pathway are likely due to traffic shifting from Aurora Avenue N onto Elliot Avenue as an alternate pathway.

B Pathways

"B" Pathways saw an improvement of travel times of up to one minute compared to the Fall 2015 reporting period. This reflects improving conditions on Aurora Avenue.

I Pathways

The inbound I.1 pathway continues to experience travel times 2-5 minutes longer than baseline conditions. Morning peak for inbound buses continue to be the worst performing for this pathway. Travel times observed in Fall 2015 continue for the Spring 2016 reporting period.

J Pathways

Pathways using the West Seattle Bridge continue to be impacted by the WOSCA detour, seeing travel times up to 8 minutes greater than baseline conditions. Data for the J Pathways are currently incomplete, however available data shows that travel times remain largely unchanged from the Fall 2015 reporting period.

CBD Pathways

CBD pathways on 2nd, 3rd, 4th and 5th Avenues remain largely unchanged from the Fall 2015 reporting period, with improvements seen on 2nd Avenue.

Additional highlights of changes in travel time and travel speeds observed in Spring 2016 compared to Fall 2015 and baseline conditions are noted below. See Appendix A for details.

SERVICE ADDITIONS TRAVEL TIME

The following is a summary of travel time performance of transit pathways that have received WSDOT funding during this period.

Route 21X [Pathway J.3] – Pathway J.3 travel times have improved for trips inbound to Downtown Seattle when compared to the Fall 2015 reporting period, with AM travel times improving as much as 2.5 minutes. These travel times have been positively impacted by new red bus lanes, however continue to be 1-3 minutes greater than baseline conditions due to the Wosca detour.

Route 56X [Pathway J.7] – Pathway J.7 is a peak-only pathway using the AWW. This pathway shows that travel time increases seen in the Fall 2015 reporting period have been recovered by 2-3 minutes. AM inbound travel times on this pathway are highly variable due to continued use of the Wosca Detour.

Route 121 [Pathway I.1] – Pathway I.1 is a peak-only pathway with limited reverse-peak trips. Variability in travel times seen in Fall of 2015 continue through the Spring 2016 reporting period. Inbound travel times are still 3 – 4 minutes greater than baseline conditions.

Route 120 [Pathway J.5] – Pathway J.5 data is currently incomplete. A summary of travel time performance will be provided after data becomes available.

Route 18X [Pathway A.2] – Pathway A.2, a peak-only pathway using 15th Ave and Elliott Ave, shows a one to two minute increase in travel times from Fall 2015. This is an increase that was also seen in the previous reporting period. Travel times on this pathway during AM and PM peaks are about 1 – 6 minutes longer than baseline conditions.

RapidRide E Line [Pathway B.1] – Pathway B.1 has previously shown improvement due to RapidRide improvements and BAT lanes north of the Aurora Bridge; therefore Pathway B.2 provides a better picture of the effect that construction activity in the South Lake Union area has on Pathway B.1 compared to baseline. As projects in this area have had a reduced impact, travel times in the outbound direction have continued to be close to baseline conditions, as was reported in the Fall 2015 reporting period.

ALASKAN WAY VIADUCT CLOSURE – TRANSIT IMPACT REPORT

Background

As part of the continuing Alaskan Way Viaduct (AWV) Replacement Project, the AWV was closed from April 29, 2016 through May 9, 2016 as the tunnel boring machine dug underneath the viaduct. Twelve King County Metro bus routes using the AWV to access Downtown Seattle and West Seattle were rerouted to pathways travelling through SODO during this time period, in addition to D & E Lines that were impacted by detoured general traffic. The intent of this report is to illustrate the impact to bus service travel times due to the Alaskan Way Viaduct Closure.

Study description

- Travel time data was collected using On-Board System data
- Data was collected for the following dates:
 - **Before AWW closure:** April 15, 2016 – April 22, 2016
 - **During AWW closure:** April 29, 2016 – May 6, 2016
- The following routes were directly impacted by the closure and necessitated reroutes through SODO: the RapidRide C-line, 21, 37, 55, 56, 57, 113, 120, 121, 122, 123, and 125. (Maps of the reroutes are included as an attachment)
- The RapidRide D & E-Lines were also indirectly impacted in the South Lake Union area by detoured general traffic

- The Transit pathways were grouped into 7 pathways to in order to comprehensively summarize impacts to transit travel times;

- C-Line: 42nd & Alaska St - 3rd & Stewart St
- D-Line: 15th Ave NW & NW 86th St – 1st Ave N & Denny Way
- E-Line: Aurora Ave N & N 86th St – 3rd Ave & Battery St
- 3rd Ave CBD: Yesler Way – Stewart St
- 4th Ave CBD: S Jackson St – Stewart St
- 5th Ave CBD: S Weller St – Pine St
- SODO Busway: E Marginal – Seneca St

Results

Performance by Pathway Group: Before and During Alaskan Way Viaduct Closure						
Pathway Group	Path (inbound)	Service Change Period	Median Travel Time (inbound)(6am -7pm)	Median Travel Time (outbound)(6am-7pm)	AM Peak Period Average Travel Time (inbound)(6-9AM)	PM Peak Period Average Travel Time (outbound)(4-7PM)
C - Line	42nd & Alaska - 3rd & Stewart	Before Closure	19.6	16.9	22.4	19.2
		During Closure	27.1	28.7	32.7	32.9
		% Change	38.7%	69.4%	46.0%	71.3%
D - Line	NW 86th St - Denny Way	Before Closure	27.6	24.8	28.4	27.4
		During Closure	28.6	25.1	28.7	27.0
		% Change	3.5%	1.3%	1.0%	-1.3%
E - Line	N 86th St - Battery St	Before Closure	16.3	16.6	17.0	19.2
		During Closure	16.4	16.3	17.0	18.0
		% Change	0.7%	-1.8%	0.3%	-6.3%
3rd Ave CBD	Yesler Way - Stewart St	Before Closure	7.3	7.4	6.6	8.4
		During Closure	7.4	7.8	6.7	9.0
		% Change	2.1%	5.8%	1.8%	7.4%
4th Ave CBD	S Jackson St - Stewart St	Before Closure	8.8	NA	8.3	NA
		During Closure	10.2	NA	8.4	NA
		% Change	15.9%	NA	0.7%	NA
5th Ave CBD	S Weller St - Pine St	Before Closure	NA	8.4	NA	12.2
		During Closure	NA	9.6	NA	11.1
		% Change	NA	14.2%	NA	-9.1%
113/121/122/123	E Marginal & Alaska - 4th & Seneca	Before Closure	12.2	11.6	14.1	12.3
		During Closure	21.0	25.3	21.0	24.6
		% Change	72.2%	118.9%	48.9%	100.2%

Discussion

Most transit travel times were negatively impacted by the closure. The most severely impacted Routes were the Southend Pathways; Route 113, 121, 122, and 123 which utilized the SODO Busway. These routes saw an increase of 48.9% (approximately 7 minute delay) in AM Travel Times and 100.2% (over 12.3 minute delay) in PM Travel Times. Severe impacts to these routes were likely caused by congestion in the SODO area due to rerouted traffic and conflicts which occurred with rail crossings (some rail conflicts reportedly exceeding 1 hour of impact during the closure).

The second most severely impacted route was the Rapid Ride C-Line with an AM Peak Travel Time increase of 46% (over 10 minute delay) and a PM Peak Travel Time increase of 71.3% (over 13.5 minute delay). The 3rd and 4th Ave corridors through the CBD experienced similar trends with an increase in travel times during the closure, but not as severe as the impacts to the Southend/SODO Busway Routes and RapidRide C-Line.

The Rapid Ride D and E-Lines experienced minimal delay during the AM Peak (the closure of the Viaduct at Western Ave did not likely alter inbound travel paths for commuters: most commuters were already heading into downtown Seattle, not through, and therefore these routes were minimally impacted in the AM. The Rapid Ride D and E-Lines actually had a reduction in the PM peak travel times, with the largest benefit of -6.3% (-1.2 minutes) Travel Time to the E-Line. This reduction in the PM peak travel time is likely due to less congestion on Aurora exiting the City northbound due to the lack of through traffic on Aurora through downtown Seattle.

Congestion on 5th Ave through the CBD increased during the morning, likely due to general traffic rerouting towards I-5 and entering the CBD in this area. The travel times for 5th Ave decreased during the PM commute. This is likely due to the measures taken to increase capacity on 5th Ave during the closure, such as prohibiting Bolt and Casino bus loadings on 5th and removing parking to increase the quantity of navigable lanes.

Overall the results show that transit travel times were generally increased during the Alaskan Way Viaduct Closure, especially those routes travelling from West Seattle and through SODO. The South Lake Union routes had tertiary delays inbound and benefits outbound due to augmented general traffic patterns. The successful reduction of PM Peak Travel Times on 5th Ave demonstrates that actions taken by Metro, SDOT, and WSDOT to mitigate the impacts of the closure were and can be successful. Metro and partner agencies should strive to achieve the mitigation on other corridors that was achieved on 5th Ave in the future. Key points to note during future Alaskan Way Viaduct Closures:

- Routes which utilized the SODO Busway during the closure were the most severely impacted
 - Success of the SODO Busway as a detour path is directly tied to rail operations and the mitigation of rail conflicts.
 - The SODO Busway performance as a reroute though usually beneficial and intuitively appealing is unreliable due to rail operations and should only be used as a primary reroute if rail conflicts can be controlled.
- The West Seattle Bridge to 4th Ave S through SODO was the second most impacted Corridor
 - Transit benefitted from an exclusive transit lane on the West Seattle Bridge
 - Most delays on this path occurred on 4th Ave S through SODO, where transit was mixed with rerouted general purpose traffic
 - Separating Transit and general purpose traffic on 4th Ave S could greatly reduce transit delays in the future.
- 1st Ave and 4th Ave through SODO were heavily congested (SDOT observations)
 - The majority of rerouted/impacted Southend and West Seattle commuters utilized these corridors as reroute paths
 - Future mitigation for general purpose traffic should focus on these corridors
 - Removing parking on 4th Ave to facilitate added travel lanes will only be successful if lane markings are upgraded and clearly convey the novel use of the lane to commuters
- 6th Ave S and Airport Way S should be considered as potential transit reroute paths into Seattle.
 - Though these potential routes may offer more benefit than 1st and 4th Ave through SODO, they will experience delays similar to the SODO Busway due to rail conflicts; mitigating rail conflicts is crucial to the success of these potential reroutes.
- Mitigation efforts in Southlake Union, specifically the egress and ingress to Aurora were successful and should be duplicated in the future.

ReRoutes: 113, 121, 122, 123



ReRoutes: 21E, 36 (SB), 55, 56, 57, 120, 125, RapidRide C



Transportation Demand Management Report

TDM REPORT PURPOSE

Transportation Demand Management (TDM) projects are designed to improve system efficiency by reducing traffic congestion on SR 99 during the construction of the AWW program. WSDOT is investing \$800,000 July 1, 2015 to June 30, 2017 in strategic trip reduction projects to complement the Enhanced Transit Service project with employer outreach and promotions of the enhanced transit service. These projects encourage people to ride the bus, helping to fill seats on the added bus service. The TDM projects also help show people their travel options which include carpooling, vanpooling, teleworking, or flexing their work schedules.

The goal of the overall TDM project is to reduce *800 peak round trips each weekday*. A description of the TDM projects follows in TDM Table 1 below:

TDM Table 1

TDM Project Definitions	
Program	Description
Employer Outreach \$335,000 WSDOT	<p>To be implemented in 3 parts:</p> <ol style="list-style-type: none"> 1) Market and sell ORCA Passport to employers in Central Business District, Pioneer Square, First Hill, and Belltown. Deliverable: Conduct outreach in the markets described above and distribute 400 transit passes. Conduct 12 outreach events at employers to encourage increased use and/or distribution of Passport. Budget: \$200,000 2) Provide incentives to get new ORCA Passport customers on board along the viaduct travel shed including Central Business District, Pioneer Square, First Hill and Belltown. Outreach focused on weekday, peak-period commuters. Deliverable: Distribute 400 incentives. Budget: \$65,000 3) Outreach to employers with high proportion of low-income employees to encourage use of transit and promote ORCA LIFT. Will focus on hotel employers with staff arriving to work during the peak period. Deliverable: Engage 6 hotels in the target area and host 6 events. Budget: \$70,000

<p>Transit Promotions \$445,000 WSDOT</p>	<p>To be implemented in 3 parts:</p> <ol style="list-style-type: none"> 1) Support 7-10 day viaduct closure in February 2016 (estimated date), with messaging to try new modes of transportation during closure in exchange for incentives to get started. Advertise via traditional and social media (radio, billboards, local newspaper ads, Facebook, Twitter, etc). Drive people to website with pertinent information, sign up and incentive information. Deliverable: Promote enhanced transit to 10,000 households in identified neighborhoods. Budget: \$55,000 2) Conduct 4 to 6 corridor-based mailings along corridors with enhanced transit service. Communicate value of bus routes on and connecting to the corridor and potential for connections to transit by active modes of transportation where facilities are available. Focus mailings on corridors in neighborhoods identified in previously completed traffic analysis such as West Seattle, White Center, South Park and Burien and on corridors where routes have added trips – 18X, 21X, 56, 120 and 121. Deliverable: Conduct a minimum of 4 mailings along corridor with enhanced transit service. Promote transit services to 30,000 households served by enhanced transit. Budget: \$215,000 3) Support enhanced transit service by delivering an ongoing campaign that includes local print and online geo-targeted media, outreach events, and messaging at bus stops or on buses to existing riders to ride more. Focus on corridors in neighborhoods identified in previously completed traffic analysis such as West Seattle, White Center, South Park and Burien and on corridors where routes have added trips – 18X, 21X, 56, 120 and 121 corridors noted above. Deliverable: Promote enhanced transit to 30,000 households. Budget: \$175,000
<p>Strategic Plan and Measurement \$20,000 WSDOT</p>	<p>Analyze and report on overall results of transportation demand management efforts.</p>

TDM PROGRAM TIMELINE

The program schedule is below:

TDM Table 2

	2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
TDM Program Timeline												
Employer Outreach			◆									◆
Transit Promotions					◆							◆
Strategic Plan and Measurement				◆								◆

TDM Program Update and Performance

Listed below in TDM Table 3 are the TDM program updates for March 26, 2015 to September 9, 2016.

At the beginning of the contract, Metro worked with WSDOT staff to develop the methodology to measure performance. The factors used to measure progress in the AWV TDM program used past performance and other factors to estimate performance. All the TDM elements are implemented in an environment where many different actions interact including but not limited to other promotions, changes in bus service, and construction activities. Broader factors like the price of gas, seasonal effects, unemployment, and other economic factors, can also influence a traveler's choice.

TDM Table 3

TDM Program Update – (March 26, 2015 – September 9, 2016)	
Employer Outreach	<p>Performance: This program has reduced 81 trips.</p> <p>Activities: Employer outreach was provided via continued marketing to employers in the target neighborhoods and via staff sales outreach in the Seattle Central Business District, First Hill, Pioneer Square and Belltown. 345 new Passports were sold during this period.</p>
Transit Promotions	<p>Performance: This program has reduced 675 trips.</p> <p>Activities: Developed the Just One Trip campaign to include preparation for the launch of the Just One Trip ORCA card offer and route promotion campaign. Mailers were sent to 29,816 households along the 21X, 56, 120 and 121 route corridors. People began signing up (1,717 by end of this reporting period) and received an ORCA card or Metro free ride tickets to encourage them to try these routes. The mailings were accompanied by geo-targeted social media advertising using Facebook, Twitter and Google Adwords and other digital media channels.</p>

As of this reporting period, 756 trips have been reduced.

TDM Table 4

Activity	Trip Reduction (round trips reduced daily)		Individual Metrics		
	Target for entire program period	Current performance	Description	Target for entire program period	Current performance
Employer Outreach	400	81			
Subtask 1			Transit Passes Distributed	400	1,303
Subtask 1			Outreach events held	12	13
Subtask 2			Transit Incentives Distributed	400	1,303
Subtask 3			Hotels engaged	6	0
Subtask 3			Outreach events held	6	0
Transit Promotions	400	675			
Subtask 1			Households	10,000	23,757
Subtask 2			Households	30,000	68,944
Subtask 2			Household mailings completed	4	5
Subtask 3			Households	30,000	Impressions: 865,657 Clicks: 10,940*
TOTAL	800	756			

*Internet impressions and click throughs reached approximately 77,529 households.

TDM BUDGET AND EXPENDITURE – SEPTEMBER 2016

The estimated cash flow as of September by quarter is listed in the tables below.

TDM Table 5

2Q2016 - Apr-Jun 2016

Activity	Expenses this period	Total Expenses to date	Total Budget by Task	% of total budget
Employer Outreach	\$32,596.51	\$113,749.68	\$335,000.00	34.0%
Transit Promotions	\$33,389.41	\$55,464.83	\$445,000.00	12.5%
Measurement	\$4,014.08	\$5,324.80	\$20,000.00	26.6%
Total	\$70,000.00	\$174,539.31	\$800,000.00	21.8%

3Q2016 - Jul-Sep 2016

Activity	Expenses this period	Total Expenses to date	Total Budget by Task	% of total budget
Employer Outreach	\$15,854.75	\$129,604.43	\$335,000.00	38.7%
Transit Promotions	\$61,726.05	\$117,190.88	\$445,000.00	26.3%
Measurement	\$3,440.64	\$8,765.44	\$20,000.00	43.8%
Total	\$81,021.44	\$255,560.75	\$800,000.00	31.9%

Calc Sheet Version
1.3

ORCA Passport	
During Program Implementation	
Alternate Mode Share (transit and vanpool) for Passport Sites	54.1%
Alternate Mode Share for Non-Passport Sites	46.4%
Retention of Newly Distributed Passports	90.0%

*passports in use are calculated per neighborhood, assuming that, at the time of their expiration (after one year), cards have a retention rate as specified above

Weekday Ridership, Summer 2015 through Summer 2017									WSDOT Analysis						
	Composite Baseline		Targeted Promotions by Pathway or Route and Service Period						Annualized Trip Reductions						Total Round Trips Reduced
Pathway / Route	Winter	Summer	Summer 2015	Winter 2015	Summer 2016	Winter 2016	Summer 2017		Summer 2015	Winter 2015	Summer 2016	Winter 2016	Summer 2017		Summer 2015 through Summer 2017
Pathway I - SODO / Georgetown	14,967	14,352			14,120						0				0
Pathway J - West Seattle	32,830	32,919			35,220						675				675
Pathway A - Ballard / Magnolia	22,438	22,913													0
Pathway B - Aurora / Fremont	43,531	43,800													0
															0
															0
															0

*Performance of the transit promotions is measured at the transit pathway level which includes routes with enhanced transit services funded by WSDOT. We are unable to distinguish between the effects of the promotion versus the enhanced transit service so their performance is measured jointly. However, not all performance of the enhanced transit service is represented here since measurements are only shown for periods when promotions were implemented.

675

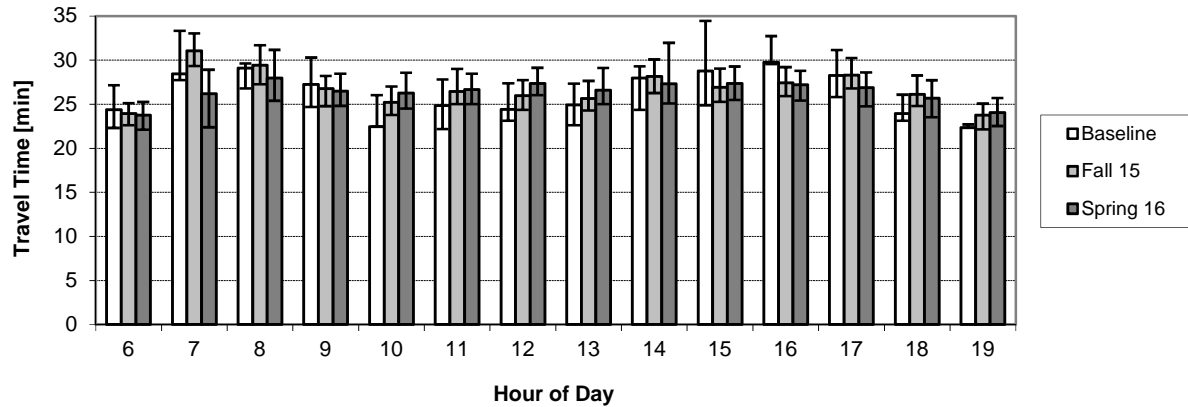
Annualized Trips Reduced =
$$\frac{(Average\ Daily\ Ridership\ in\ Service\ Period - Baseline\ Daily\ Ridership)}{2\ trips\ per\ day} * \frac{Number\ of\ days\ in\ Service\ Period}{254\ Weekdays\ Per\ Year}$$

	Summer 2015	Winter 2015	Summer 2016	Winter 2016	Summer 2017		Total
Households / Employees Reached	0	39,128	29,816				68,944

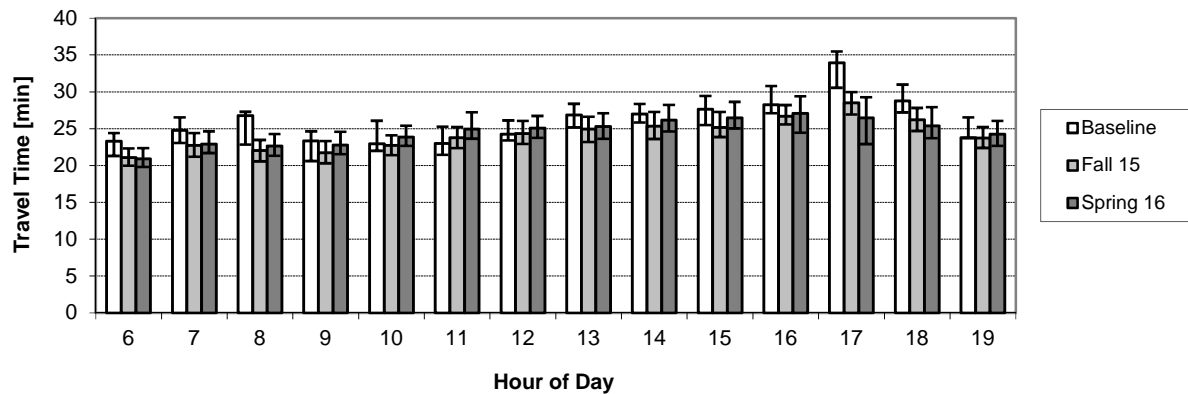
Pathway A.1

15th Ave NW & NW 85th St to 1st Ave & Denny Way via 15th/Elliott/Mercer

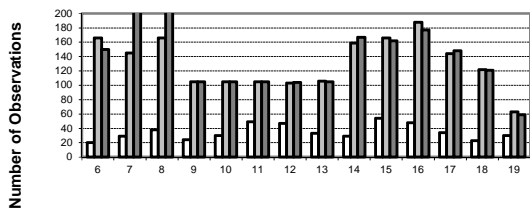
INBOUND Performance: Median Travel Time & Variability



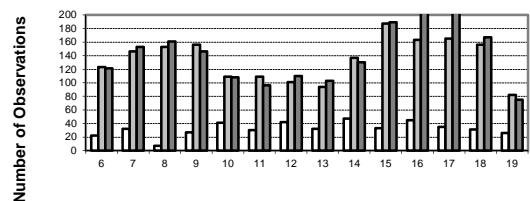
OUTBOUND Performance: Median Travel Time & Variability



Sample Size: INBOUND



Sample Size: OUTBOUND

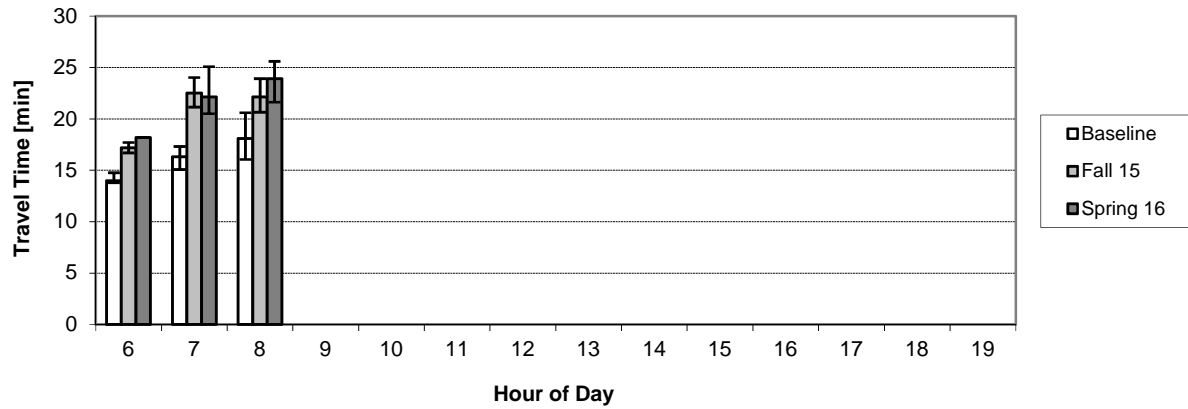


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	TSP
Spring 16	3/28/16 - 4/25/16	TSP

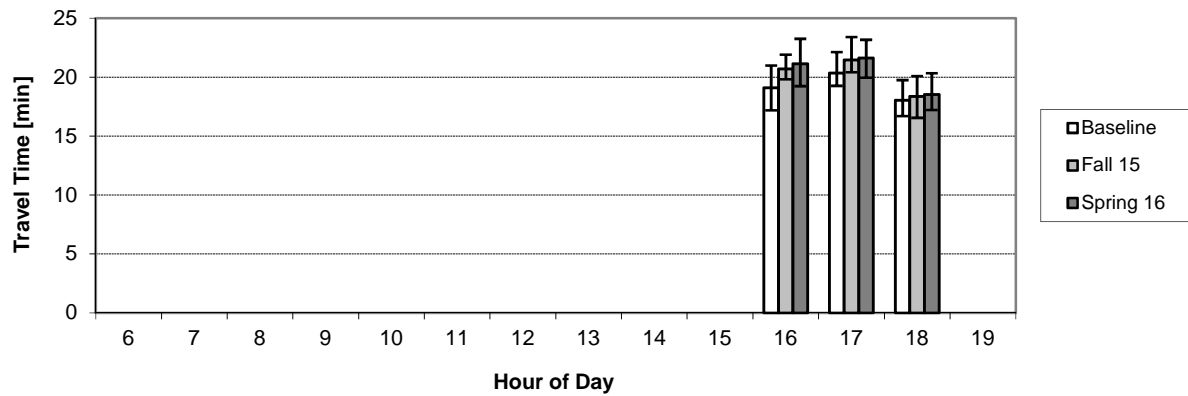
Pathway A.2

15th Ave NW & NW 85th St to 1st Ave & Denny Way via 15th/Elliott/Western (Peak Only)

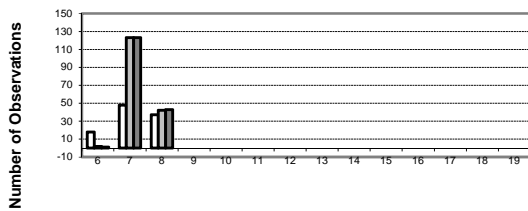
Inbound Performance: Median Travel Time & Variability



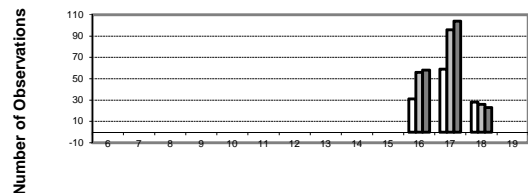
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

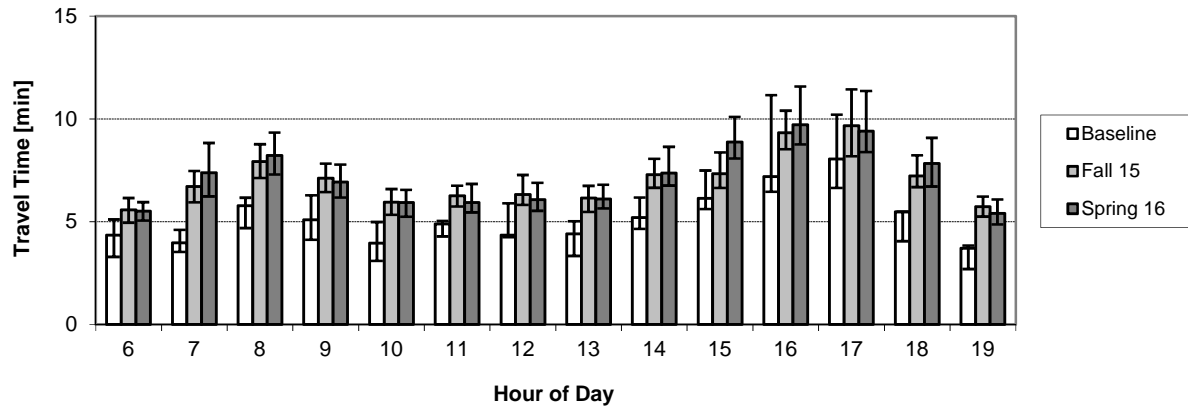


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL-AVI

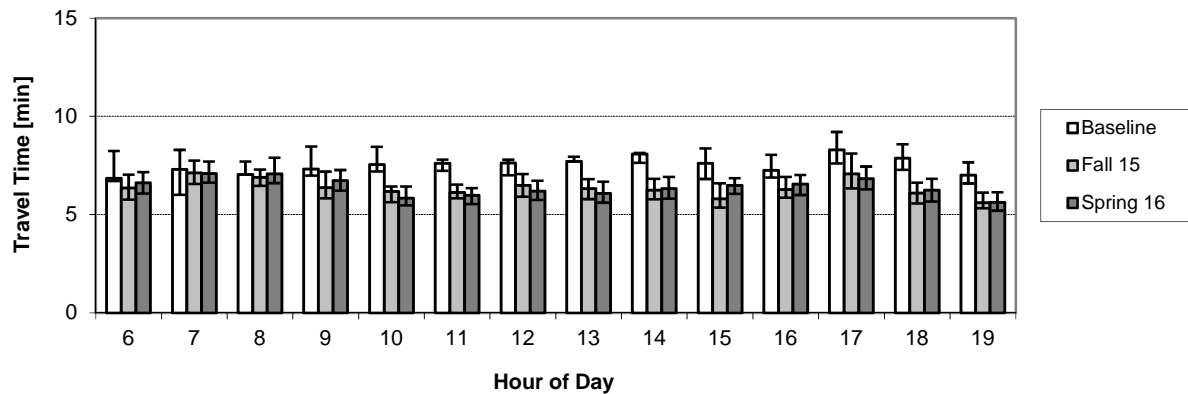
Pathway A.3

Magnolia Bridge to 1st Ave & Denny Way via Elliott/Western

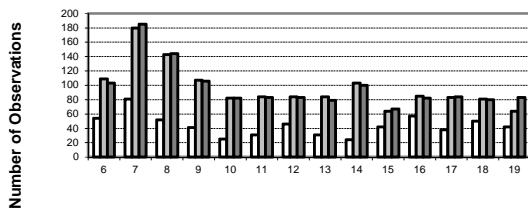
Inbound Performance: Median Travel Time & Variability



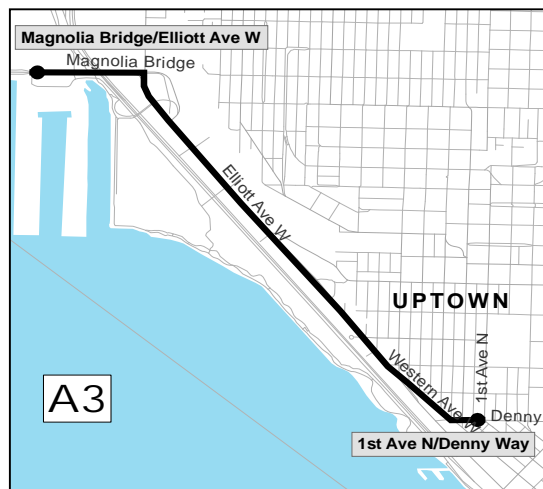
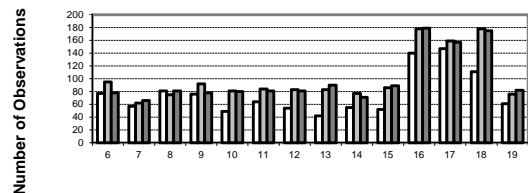
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

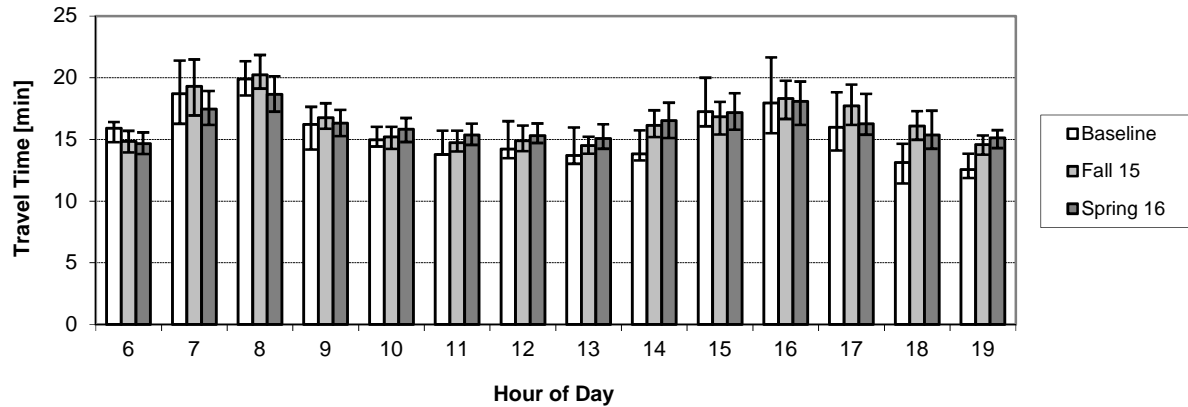


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL-AVI

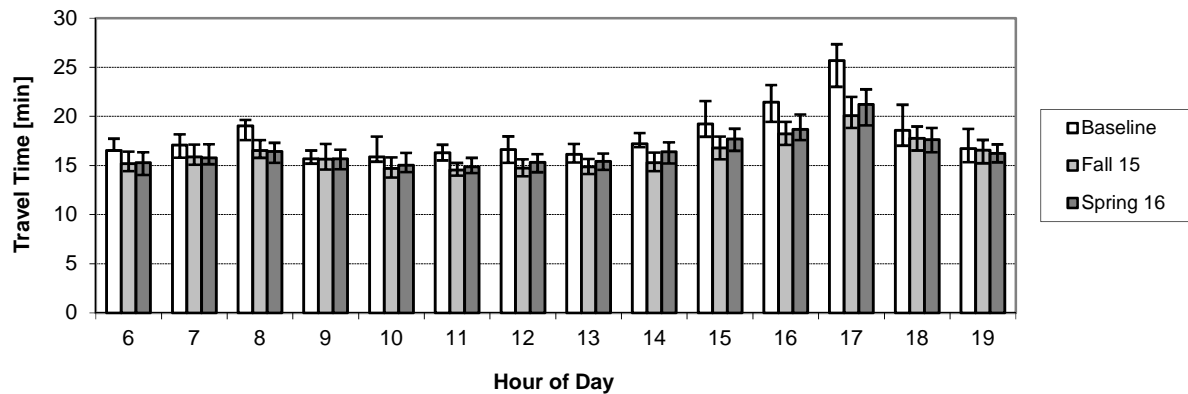
Pathway B.1

Aurora Ave N & N 85th St to 3rd Ave & Battery St via Aurora Ave

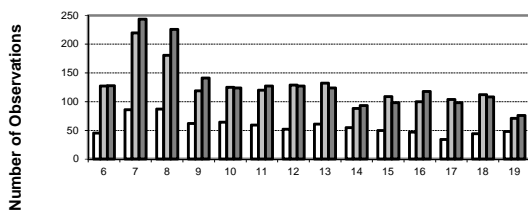
Inbound Performance: Median Travel Time & Variability



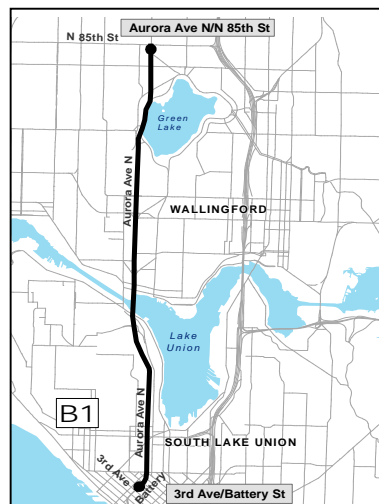
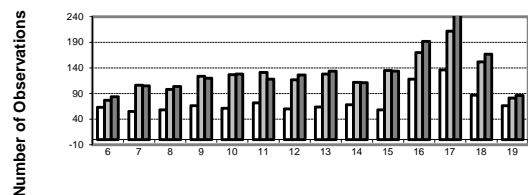
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

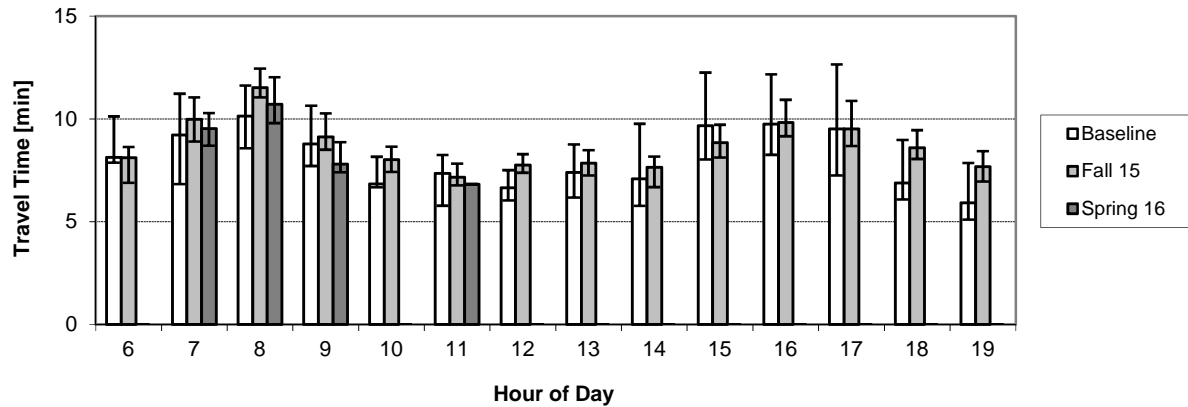


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL
Spring 16	3/28/16 - 4/25/16	AVL

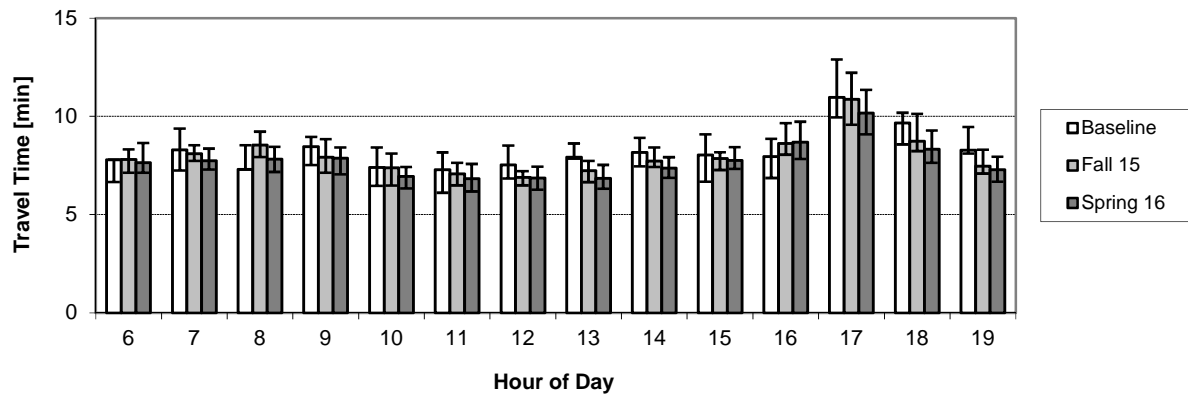
Pathway B.2

Bridge Way & N 38th St to 3rd Ave & Battery via Aurora Ave

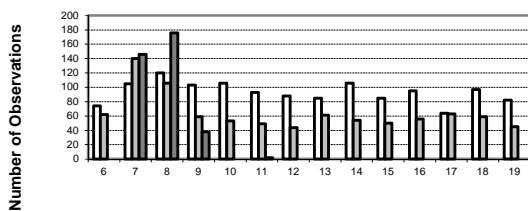
Inbound Performance: Median Travel Time & Variability



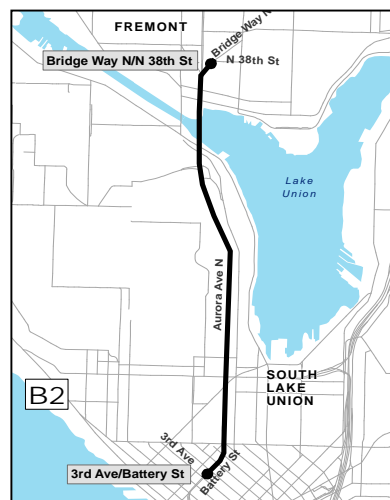
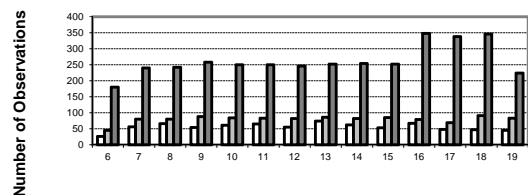
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

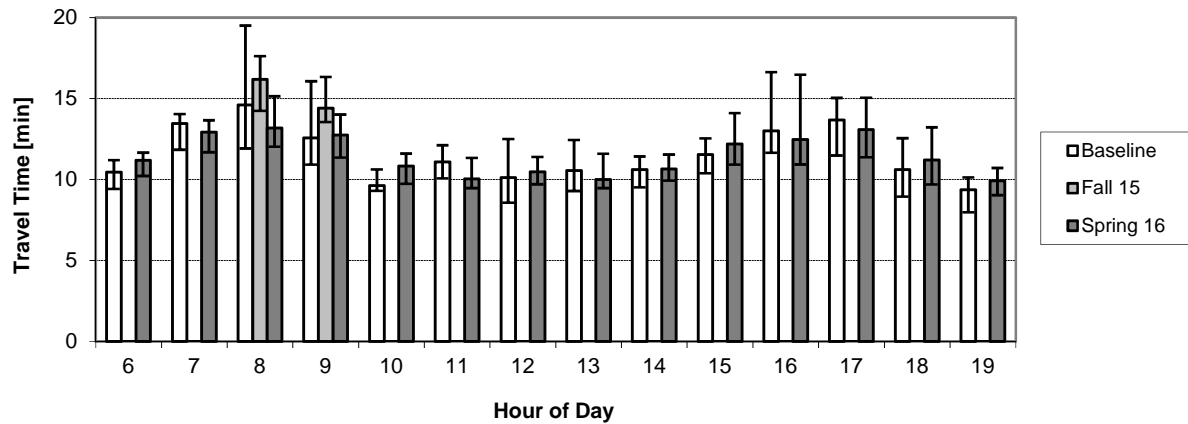


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL
Spring 16	3/28/16 - 4/25/16	AVL

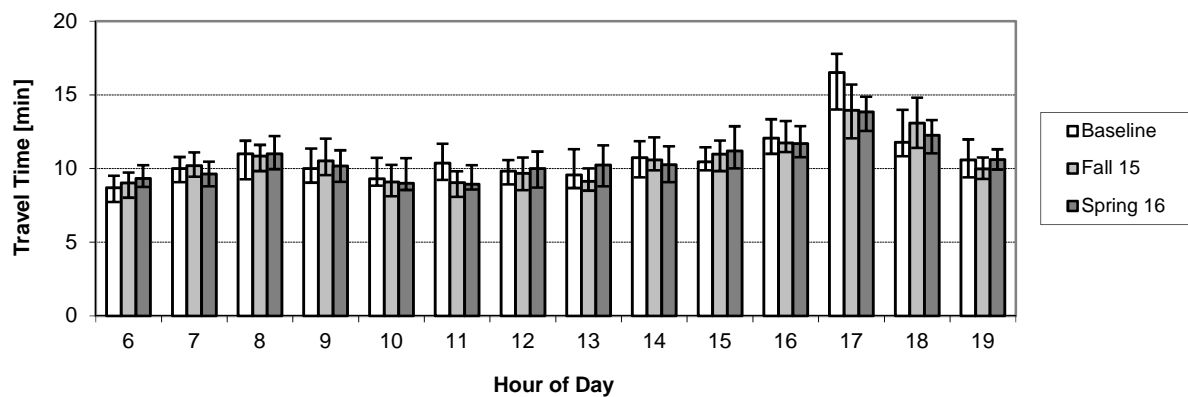
Pathway B.3

Fremont Ave N & N 34th St to Denny Way & Dexter Ave via Dexter

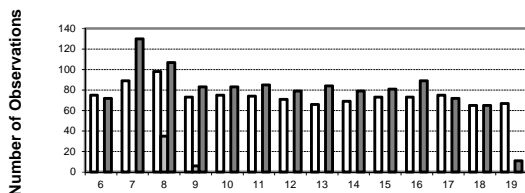
Inbound Performance: Median Travel Time & Variability



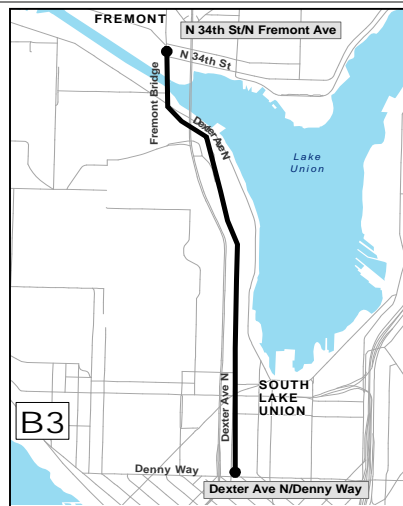
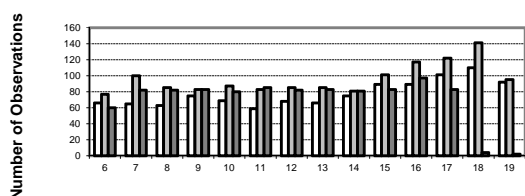
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

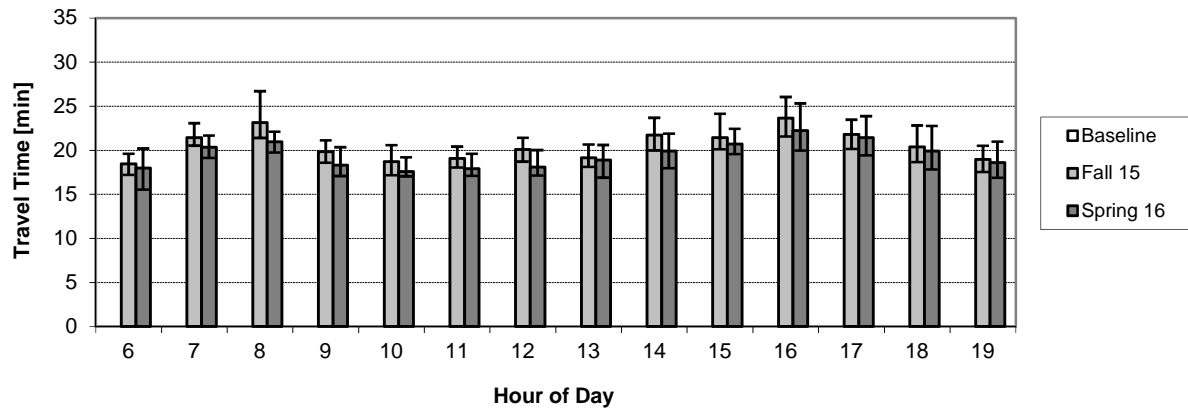


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL
Fall 15	10/12/15 - 11/9/15	AVL
Spring 16	3/28/16 - 4/25/16	AVL

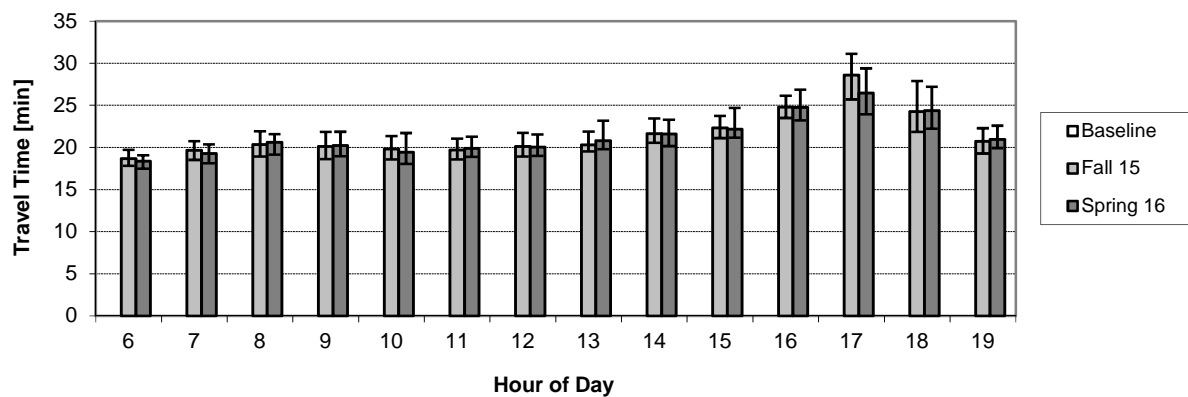
Pathway B.5

Westlake Ave/9th Ave & Denny Way to Leary Way & 15th Ave NW via Westlake Ave

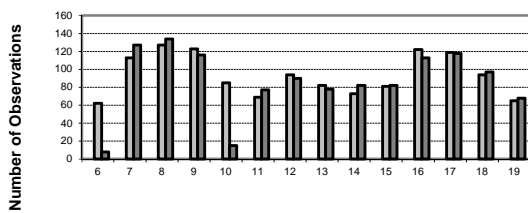
Inbound Performance: Median Travel Time & Variability



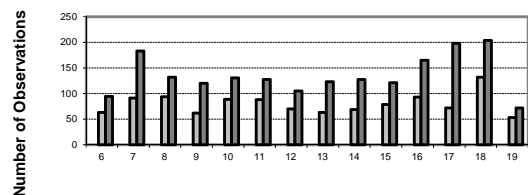
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

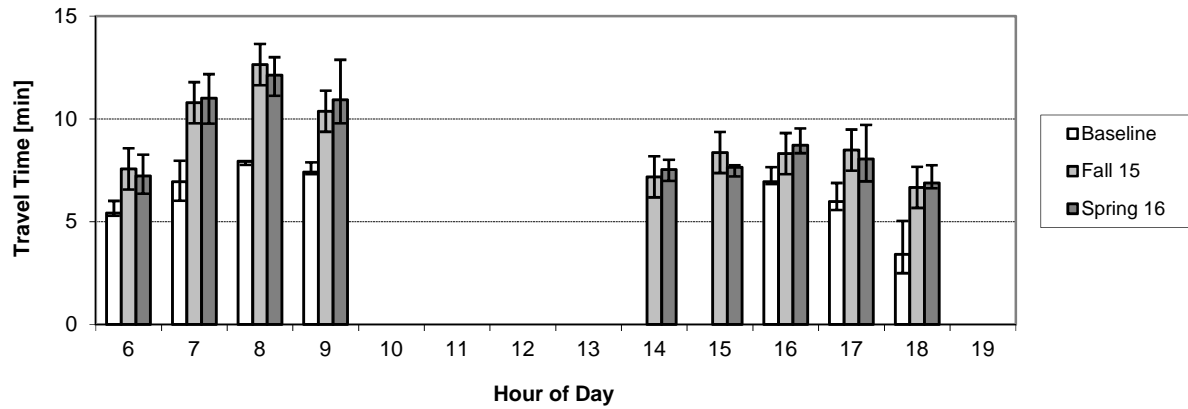


Scenario	Date Range	Data source
Baseline	Pathway was not used	N/A
Fall 15	10/12/15 - 11/9/15	STOP
Spring 16	3/28/16 - 4/25/16	STOP

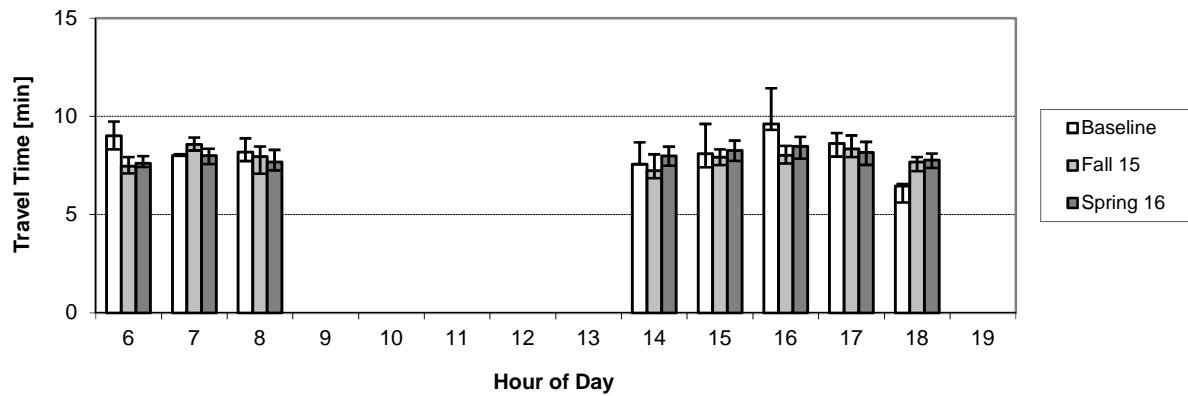
Pathway I.1

East Marginal Way & 1st Ave/Alaska St to 1st Ave & Seneca/Columbia St via Marginal/AWV

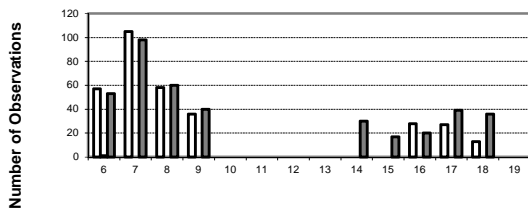
Inbound Performance: Median Travel Time & Variability



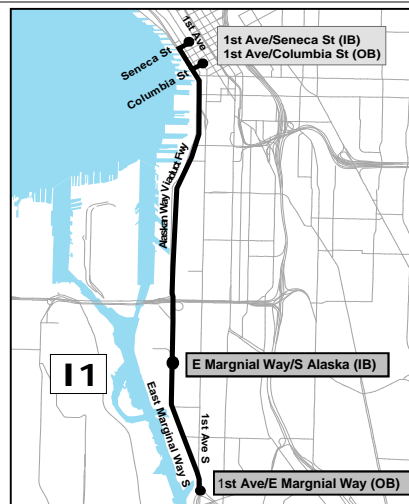
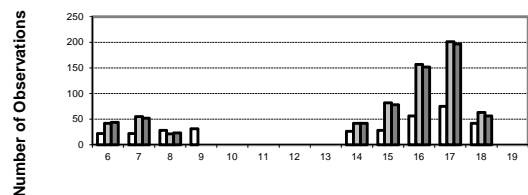
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound



Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL-AVI

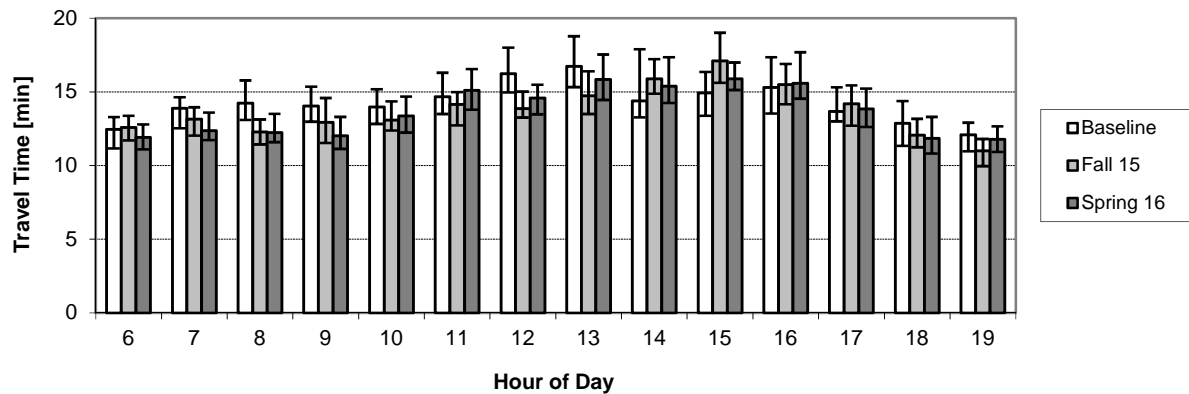
Pathway I.2

4th Ave S & S Michigan St to 4th/2nd Ave & Jackson St via 4th Ave S

DATA NOT AVAILABLE*

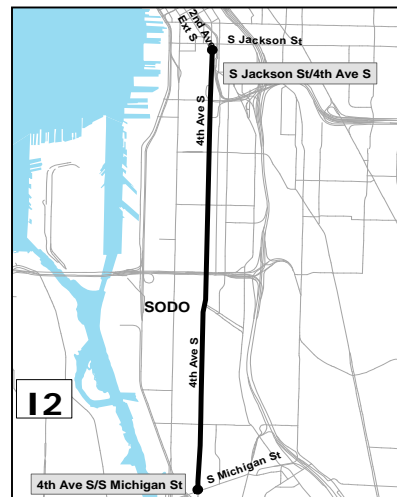
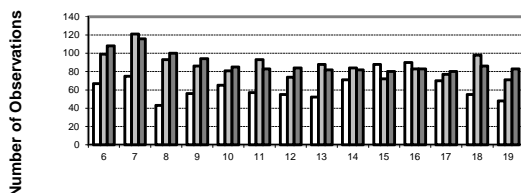
*This pathway is composed of through-routed trips, i.e. trips that change route and identification number between the start and end of trips. A previous service change has corrupted the way these two routes were linked to one another, resulting in missing travel time data. King County Metro is developing a new method for measuring this travel time that will be included in Volume 21.

Outbound Performance: Median Travel Time & Variability



DATA NOT AVAILABLE

Sample Size: Outbound



Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL

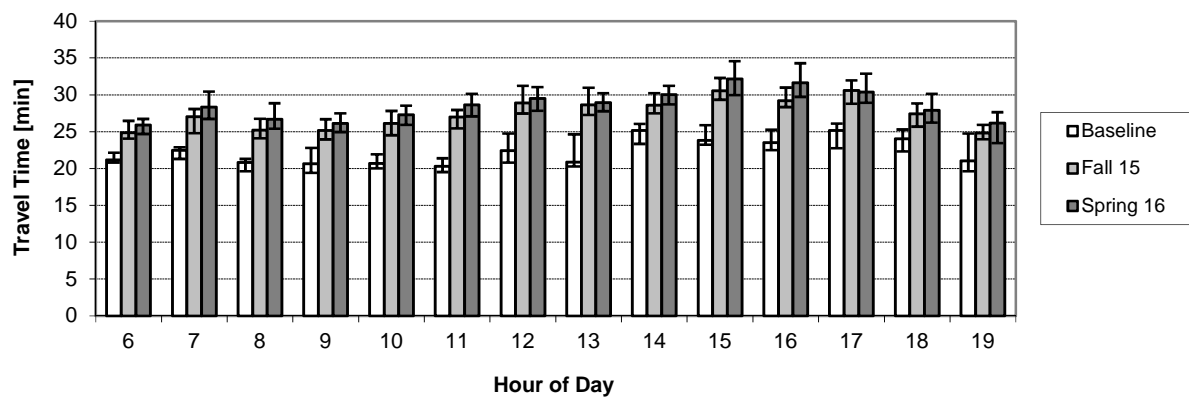
Pathway J.2

35th Ave SW & SW Morgan St to 3rd Ave & Seneca St via 1st Ave S

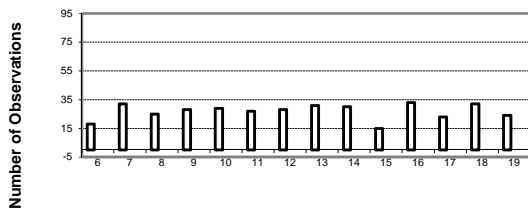
DATA NOT AVAILABLE*

*This pathway is composed of through-routed trips, i.e. trips that change route and identification number between the start and end of trips. A previous service change has corrupted the way these two routes were linked to one another, resulting in missing travel time data. King County Metro is developing a new method for measuring this travel time that will be included in Volume 21.

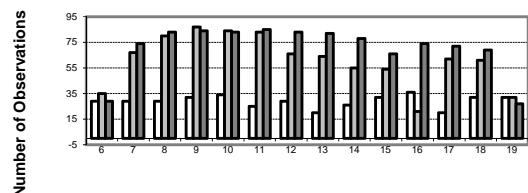
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

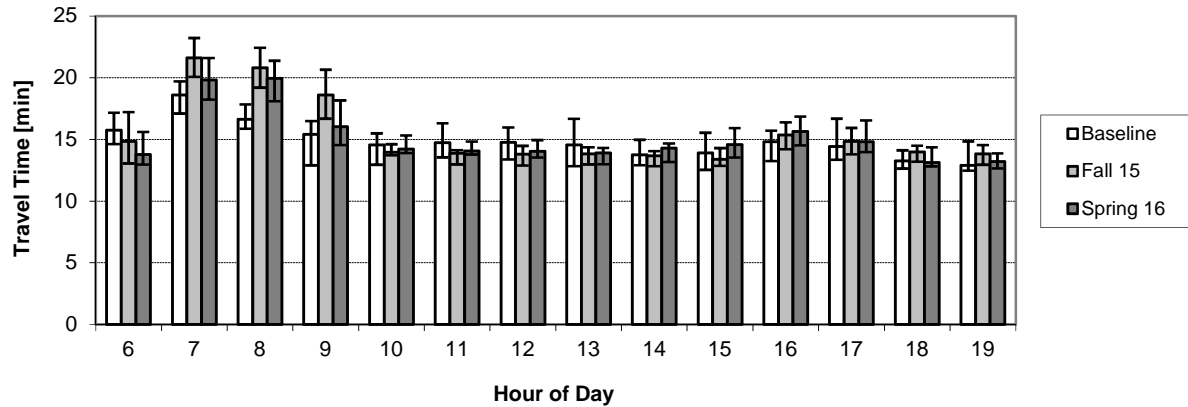


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL-AVI

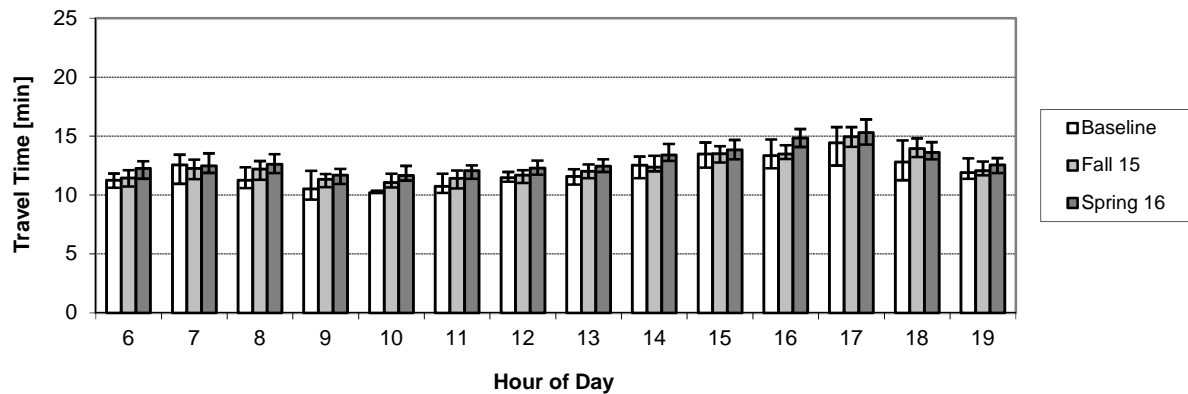
Pathway J.3

Alaska Junction to 1st Ave & Seneca/Columbia St via Alaskan Way Viaduct

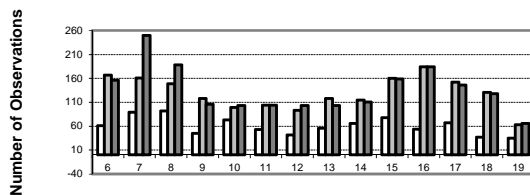
Inbound Performance: Median Travel Time & Variability



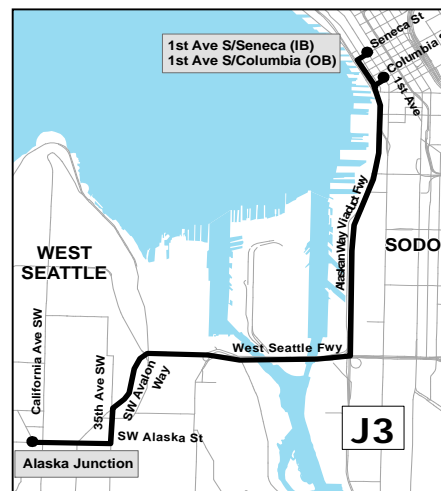
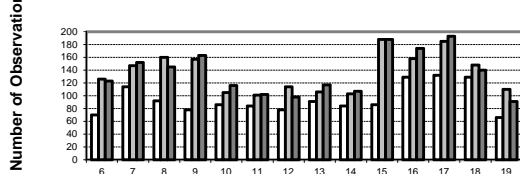
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

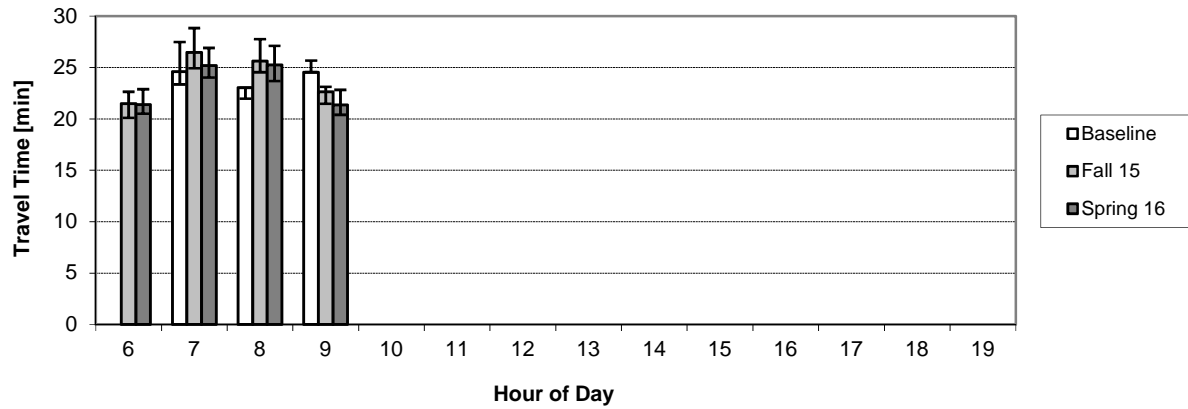


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	TSP-AVI
Spring 16	3/28/16 - 4/25/16	TSP-AVI

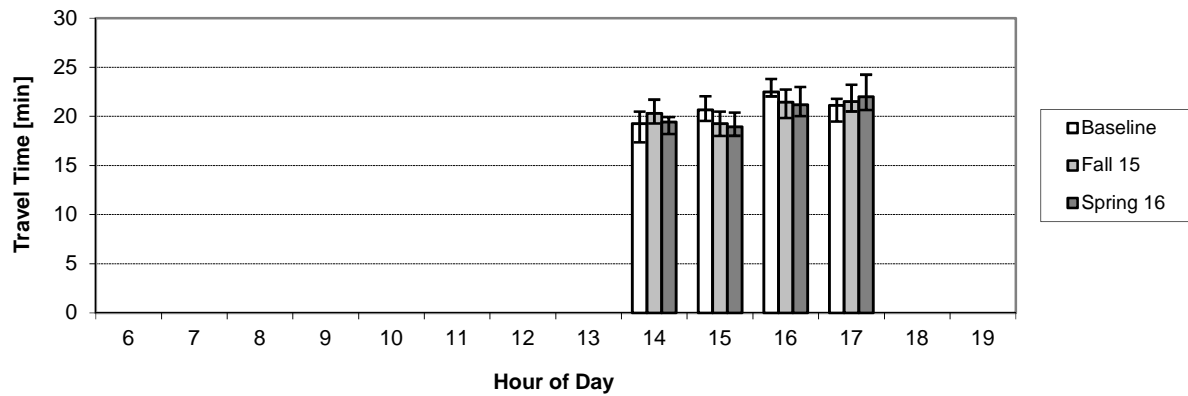
Pathway J.4

California Ave SW & SW Fauntleroy Way SW to 3rd Ave & Yesler St via 1st Ave S (Peak Only)

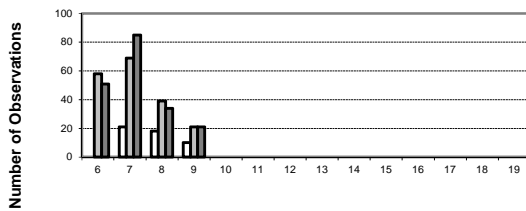
Inbound Performance: Median Travel Time & Variability



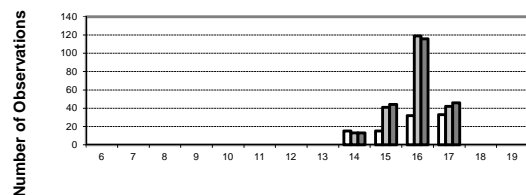
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound



Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVL-AVI
Fall 15	10/12/15 - 11/9/15	AVL-AVI
Spring 16	3/28/16 - 4/25/16	AVL-AVI

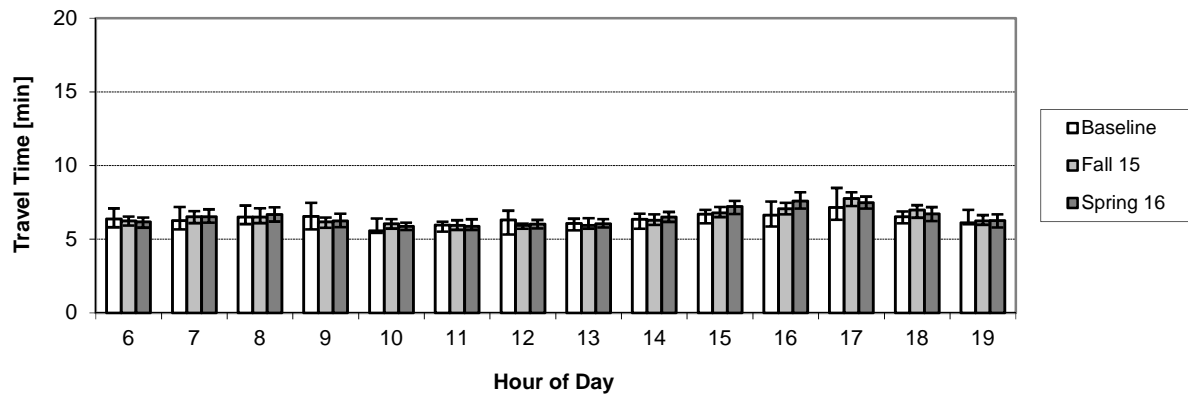
Pathway J.5

Delridge Way SW & SW Andover St to 1st Ave & Seneca/Columbia St via AWW

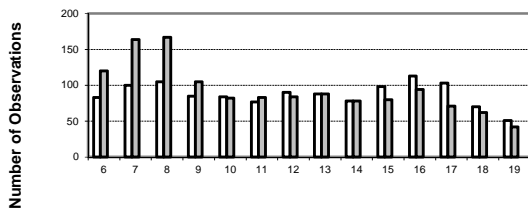
DATA NOT AVAILABLE*

*This pathway is composed of through-routed trips, i.e. trips that change route and identification number between the start and end of trips. A previous service change has corrupted the way these two routes were linked to one another, resulting in missing travel time data. King County Metro is developing a new method for measuring this travel time that will be included in Volume 21.

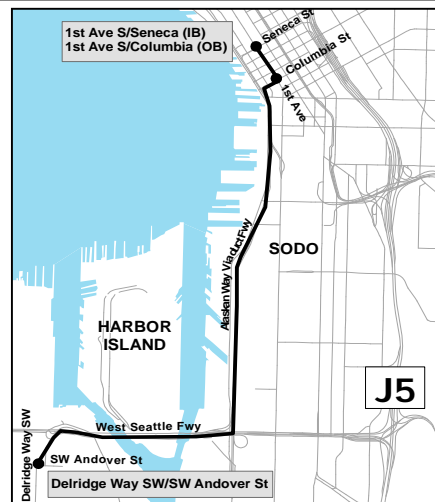
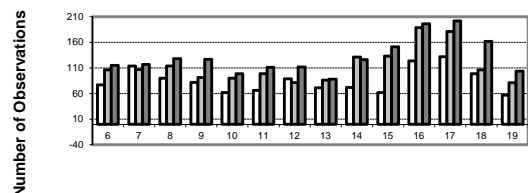
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



Sample Size: Outbound

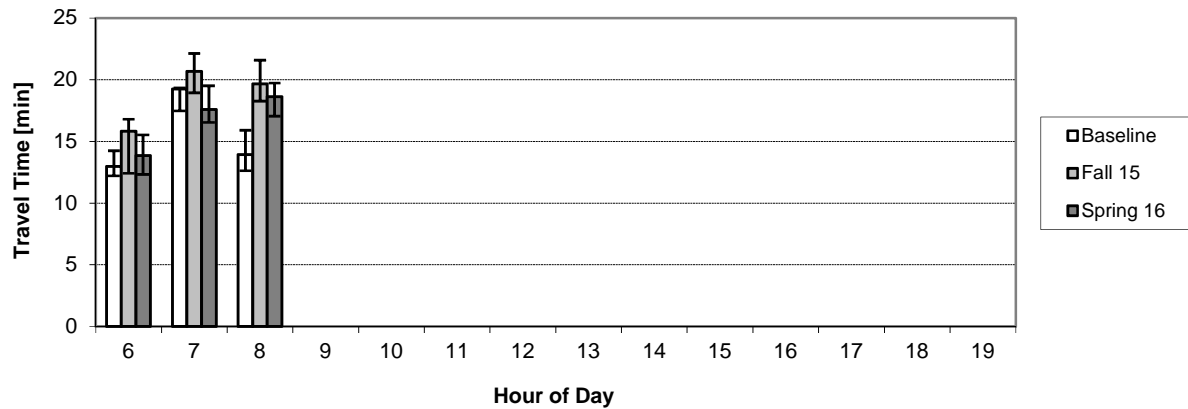


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI

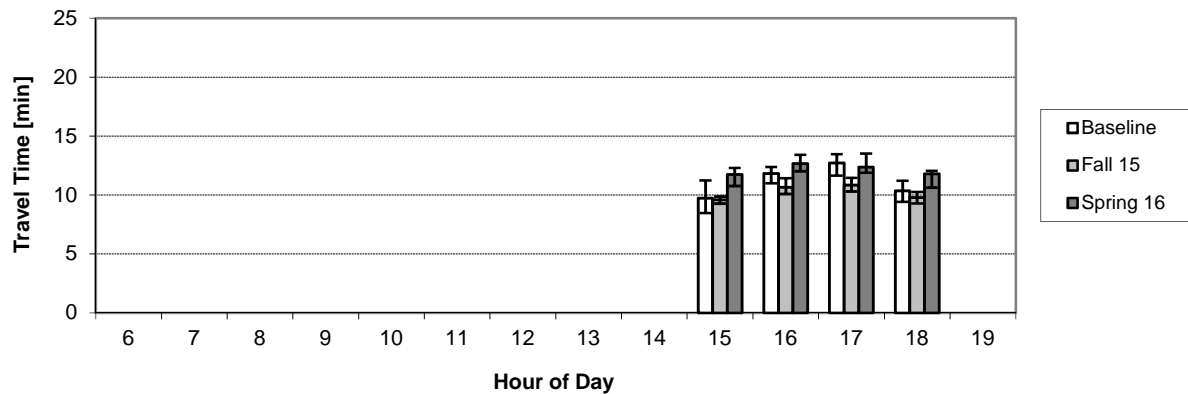
Pathway J.7

Admiral Way SW & California Ave SW to 1st Ave & Seneca/Columbia St via AWV (Peak Only)

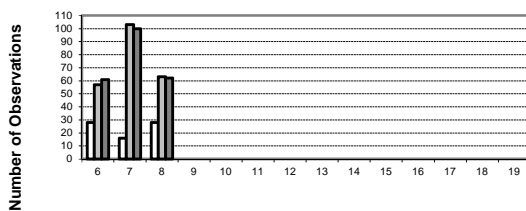
Inbound Performance: Median Travel Time & Variability



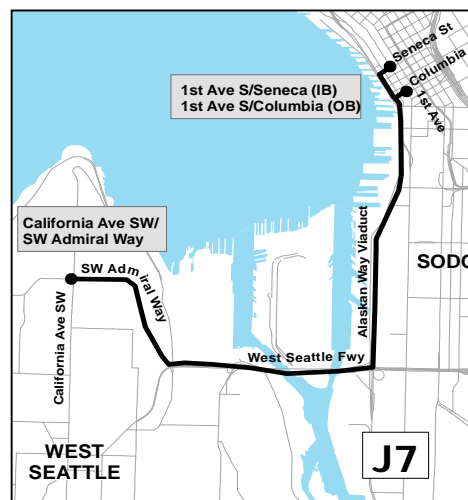
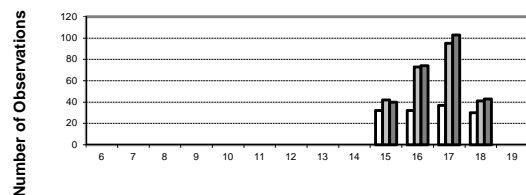
Outbound Performance: Median Travel Time & Variability



Sample Size: Inbound



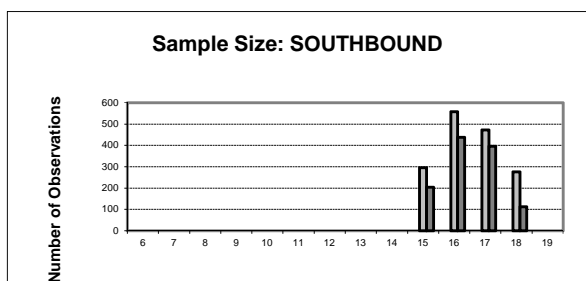
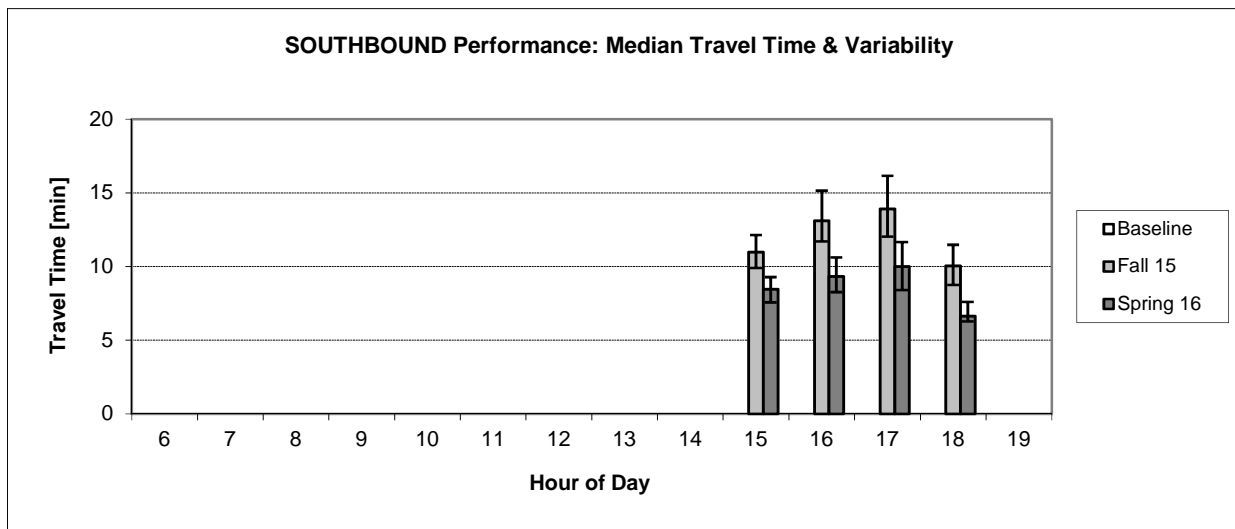
Sample Size: Outbound



Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI-AVL
Fall 15	10/12/15 - 11/9/15	AVI-AVL
Spring 16	3/28/16 - 4/25/16	AVI-AVL

Pathway CBD2

Second Avenue: Pike St to Jackson St

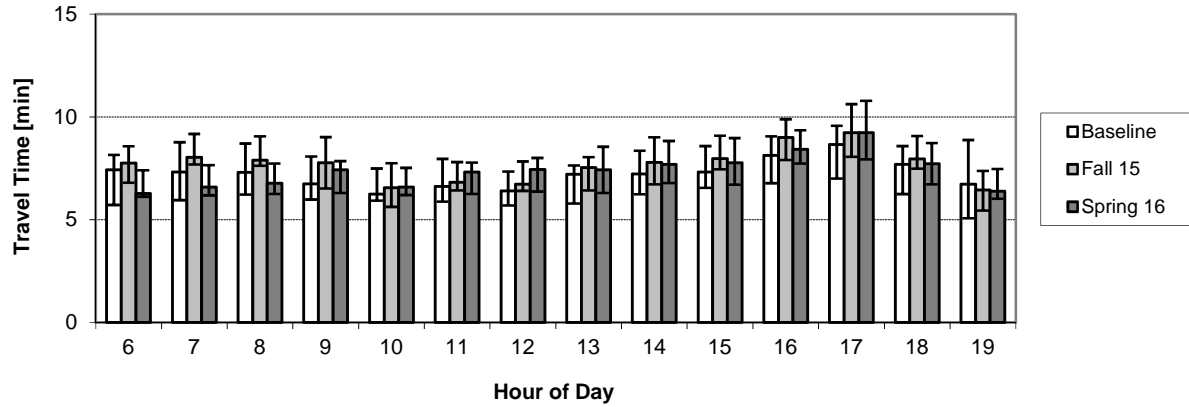


Scenario	Date Range	Data source
Baseline	Not Used	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI-AVL

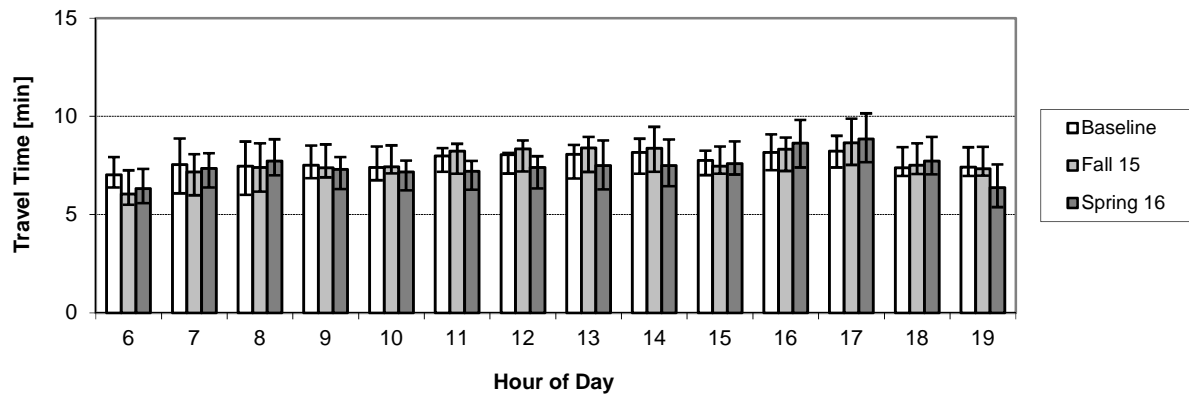
Pathway CBD3

Third Ave: Stewart St to Yesler Way

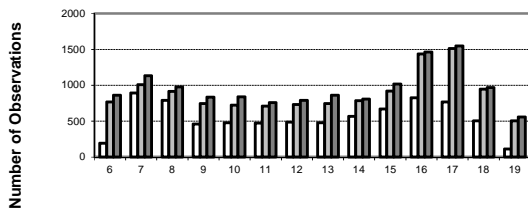
NORTHBOUND Performance: Median Travel Time & Variability



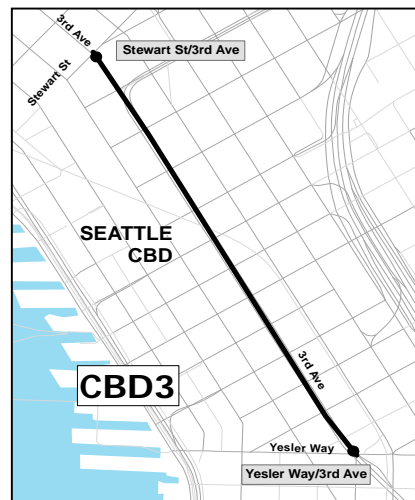
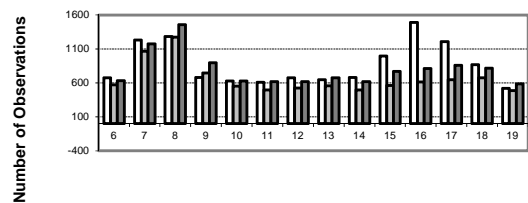
SOUTHBOUND Performance: Median Travel Time & Variability



Sample Size: NORTHBOUND



Sample Size: SOUTHBOUND

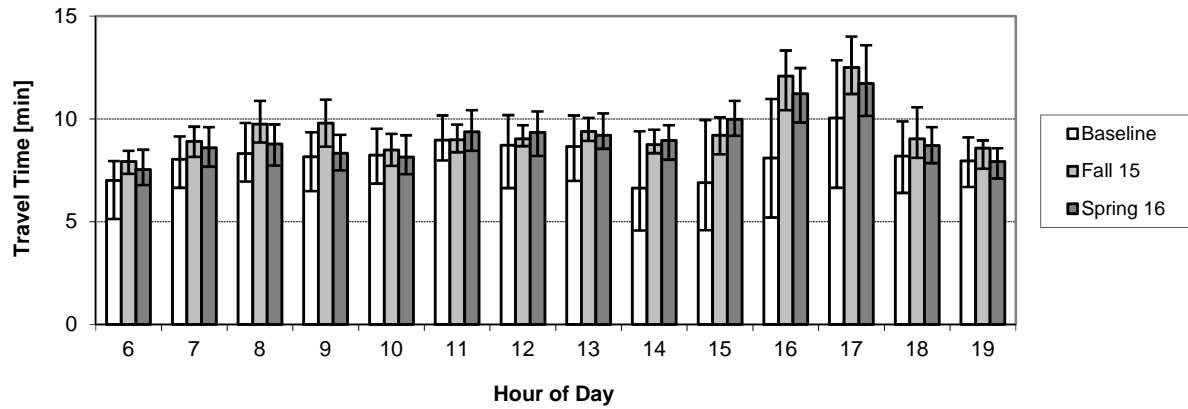


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI

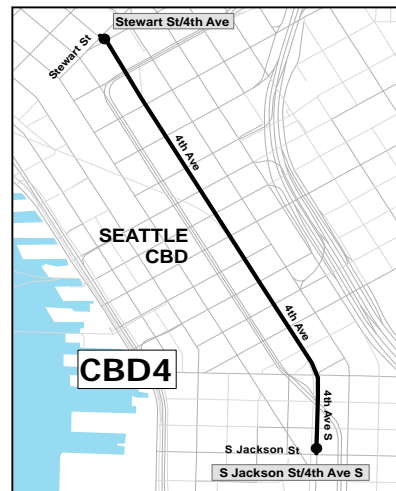
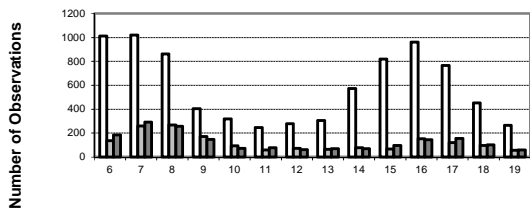
Pathway CBD4

Fourth Ave: Jackson St to Stewart St

NORTHBOUND Performance: Median Travel Time & Variability



Sample Size: NORTHBOUND

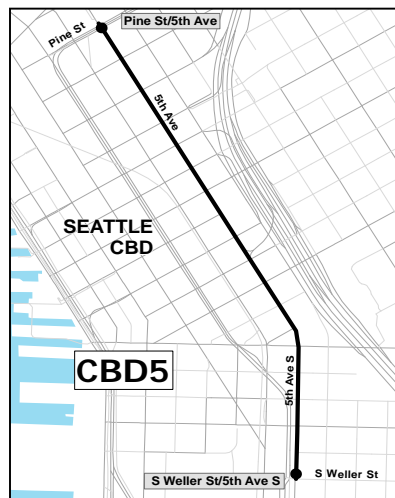
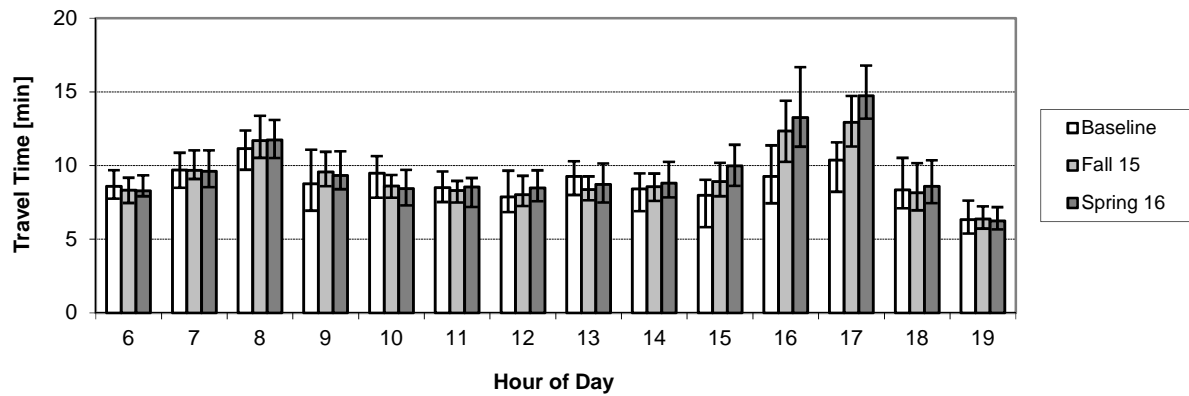


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI-AVL

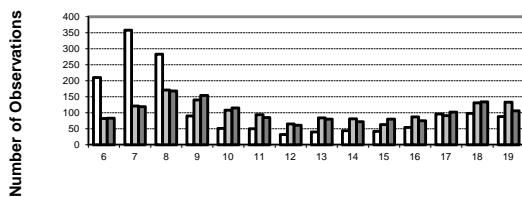
Pathway CBD5

Fifth Ave: Pine St to Weller St

SOUTHBOUND Performance: Median Travel Time & Variability



Sample Size: SOUTHBOUND

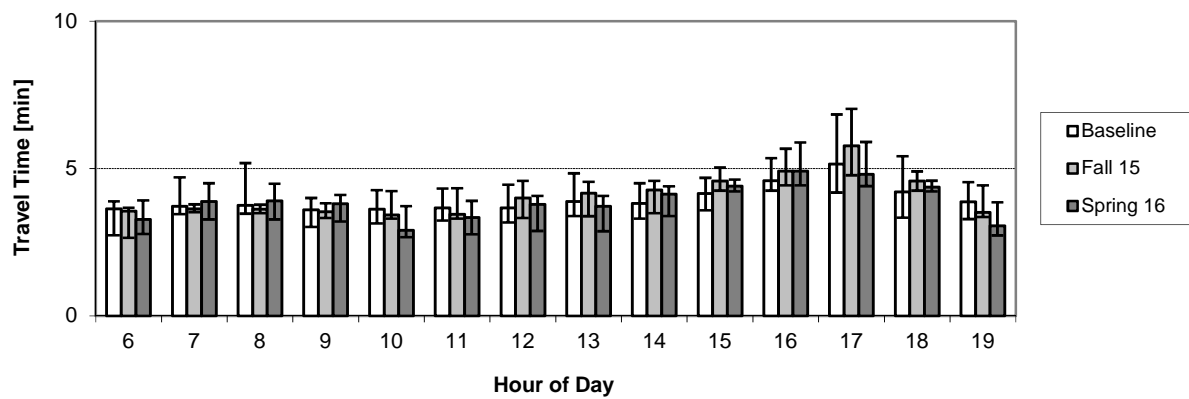


Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI

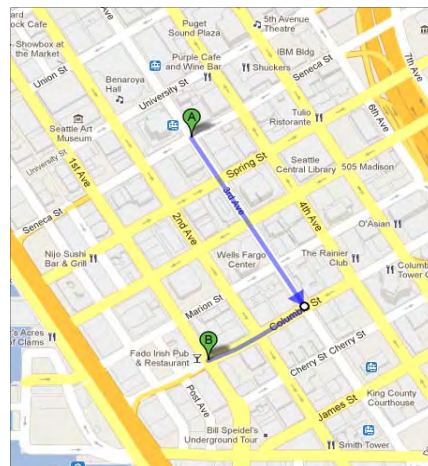
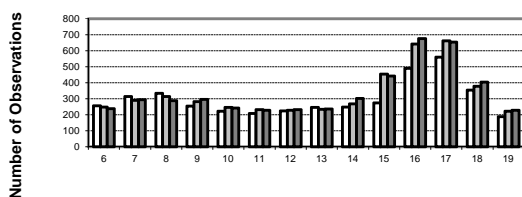
Pathway Columbia

Columbia Street: 3rd & Seneca to 1st & Columbia

SOUTHBOUND Performance: Median Travel Time & Variability



Sample Size: SOUTHBOUND



Scenario	Date Range	Data source
Baseline	9/21/09 - 10/16/09	AVI
Fall 15	10/12/15 - 11/9/15	AVI
Spring 16	3/28/16 - 4/25/16	AVI